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Volume V: Technical Appendices

June 1996

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- Final Relocation Plan
- U.S. Department of Interior – Section 4(f) Findings

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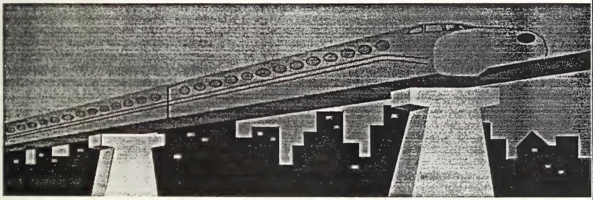
- Biological Assessment-Initial Geotechnical Program, November 1995
- Letter from USFWS to K. Pahl on Initial Geotechnical Field Program, January 19, 1996
- Letter from USFWS to K. Pahl on Off-road travel to Access Boring sites, March 28, 1996
- Biological Assessment, January 1996
- Letter from USFWS to S. Taylor, February 23, 1996
- Letter from BART to Joel Medlin, USFWS, April 16, 1996
- Letter from USFWS to S. Taylor, May 2, 1996
- Letter from BART to USFWS, May 10, 1996
- USFWS Biological Opinion, May 20, 1996

Solutions Taking Shape.

BART - San Francisco Airport Extension Project, Initial Geotechnical Program

Biological Assessment (BA) for the San Francisco Garter Snake and the California Red-legged Frog



Submitted to

U.S. Fish and Wildlife Service
Sacremento Field Office
Endangered Species Division
2800 Cottage Way, Room E-1803
Sacramento, California 95825

November 1995

OGDEN ENVIRONMENTAL AND ENERGY SERVICES

BART–San Francisco Airport Extension Project
Initial Geotechnical Survey

Biological Assessment (BA) for the San Francisco Garter Snake and the California Red-legged Frog

Submitted to:

U.S. Fish and Wildlife Service
Sacremento Field Office
Endangered Species Division
2800 Cottage Way, Room E-1803
Sacremento, California 95825

Submitted by:

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November 1995

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1. INTRODUCTION

The purpose of the proposed Geotechnical Field Investigation is to obtain information on soils and ground water levels for the proposed BART/San Francisco Airport Extension. The proposed project is a Federal Transit Administration's (FTA) Turnkey Demonstration Project that is currently in the environmental and planning phases. As part of this planning effort, geotechnical investigations need to be performed. This proposal focuses on the data related to and areas adjacent to the San Francisco garter snake habitat located on the west-of-Bayshore parcel near the San Francisco Airport.

There are several reasons why data for the Geotechnical Field Investigation Program, outlined below, is needed. In general, BART is seeking to confirm the feasibility of constructing the proposed project in an aerial alignment across the west-of-Bayshore parcel using data obtained from field investigations and other studies currently underway. BART intends to increase engineering confidence in the feasibility of project alignments prior to making final decisions on a Locally Preferred Alternative and completion of the environmental process.

Project segments in the area of the west-of-Bayshore parcel are also in the vicinity of several active earthquake faults. The presence of loose alluvial and/or sandy fill soils is expected. These types of soils are prone to liquefaction during significant earthquake events, making the determination of subsurface soil conditions critical to ascertaining the feasibility of the aerial alignment. The circumstances of building several segments of this project are unique for BART, particularly constructing aerial tracks on landfill over elevated portions of Highway 101. Therefore, additional data should be obtained to assure project safety and cost effectiveness.

The data will also be used to reconfirm identified impacts and research potential wetlands development for mitigation. Data on the subsurface soil constituents and levels of groundwater will be used to determine maximal locations for replacement wetlands. The size of the column foundations and corresponding excavations in wetland and habitat areas (necessary to support an aerial structure in these soils) will be confirmed through the field investigations. Soils testing will also be used for the development and expansion of wetlands along depressions west of the CalTrain tracks. This data will be used to complete the more detailed impacts and mitigation analysis required for the Section 404 permit application.

Particular concern for geotechnical testing in the west-of-Bayshore area was identified after the July 1995 FTA approval of the study of the southern half of the extension. Geotechnical testing is planned to begin as soon as the USFWS issues the Section 7 permit and the SFIA has granted an access permit. It is anticipated that the program will be initiated in the winter of 1995. Postponement of the proposed field testing until after the 1995-1996 winter season would substantially delay verification of project viability.

2. PROJECT DESCRIPTION

A brief description of the proposed geotechnical field investigation program for the west-of-Bayshore parcel is provided in the attached Appendix A. The proposed program includes 28 exploratory soil borings and 17 cone penetrometer tests. The proposed test locations in the west-of-Bayshore area are depicted in Figures 2-1 and 2-2.

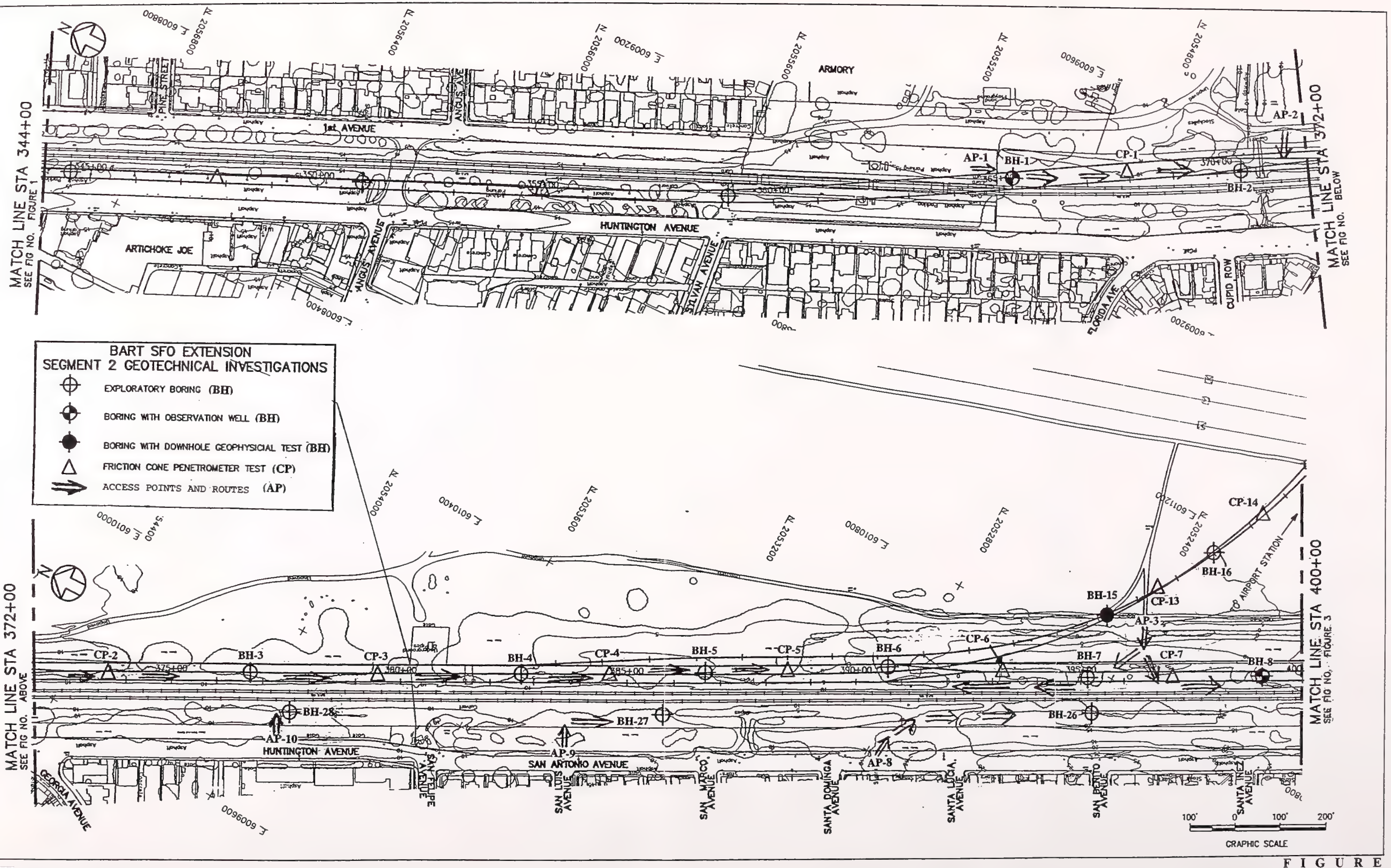
The proposed test locations have been selected specifically to avoid all wetlands and sensitive habitat on the site to the maximum extent possible. The majority of the test sites have been located on existing roadways or along the CalTrain railway ballasts to minimize impacts to upland habitats on the west-of-Bayshore parcel as much as possible. The placement of the proposed test sites and access to these sites which have been designed to avoid sensitive resources, has been reviewed and slightly modified in the field with USFWS and consulting biologists (see discussion below). The proposed geotechnical investigation program has been modified to exclude borehole (BH) sites 16, 18, 19, and 20, and cone penetrometer (CP) sites 13, 14, 15 and 16 for this initial field program. These sites will be addressed in the BA for the proposed project.

Completion of the field investigations will take no more than 28 working days, barring adverse weather conditions.

3. CONSULTATION TO DATE

Initial interaction with USFWS personnel relating to this initial program was on September 29, 1995 when a letter was submitted to USFWS describing the proposed action, effects of the proposed action and mitigation efforts associated with geotechnical testing operations on and near the west-of-Bayshore parcel. In response to this communication, a meeting was held with USFWS on October 19, 1995, to further address issues the USFWS had related to the proposed geotechnical testing program.

As a follow-up to this meeting, a site visit to the west-of-Bayshore parcel with USFWS personnel was scheduled for November 2, 1995. The purpose of this field visit was to address the specific location of the proposed testing sites and identify suitable mitigation measures. As a result of the field visit, the location of 20 geotechnical testing sites were modified to further avoid SFGS habitat. Eight bore hole (BH 6 through BH 13) and six cone penetrometer test sites (CP 6 through 11) were moved from along a dirt roadway on the west-of-Bayshore parcel to along the CalTrain right-of-way west of the fenceline, and east of the tracks. Photographs 1 and 2 of Figure 3.1 show the proposed and modified locations of the geotechnical test sites. Additionally, three soil borings (BH 17, BH 21, and BH 22) have been shifted to minimize impacts to SFGS hibernacula (see discussion in Section 6).



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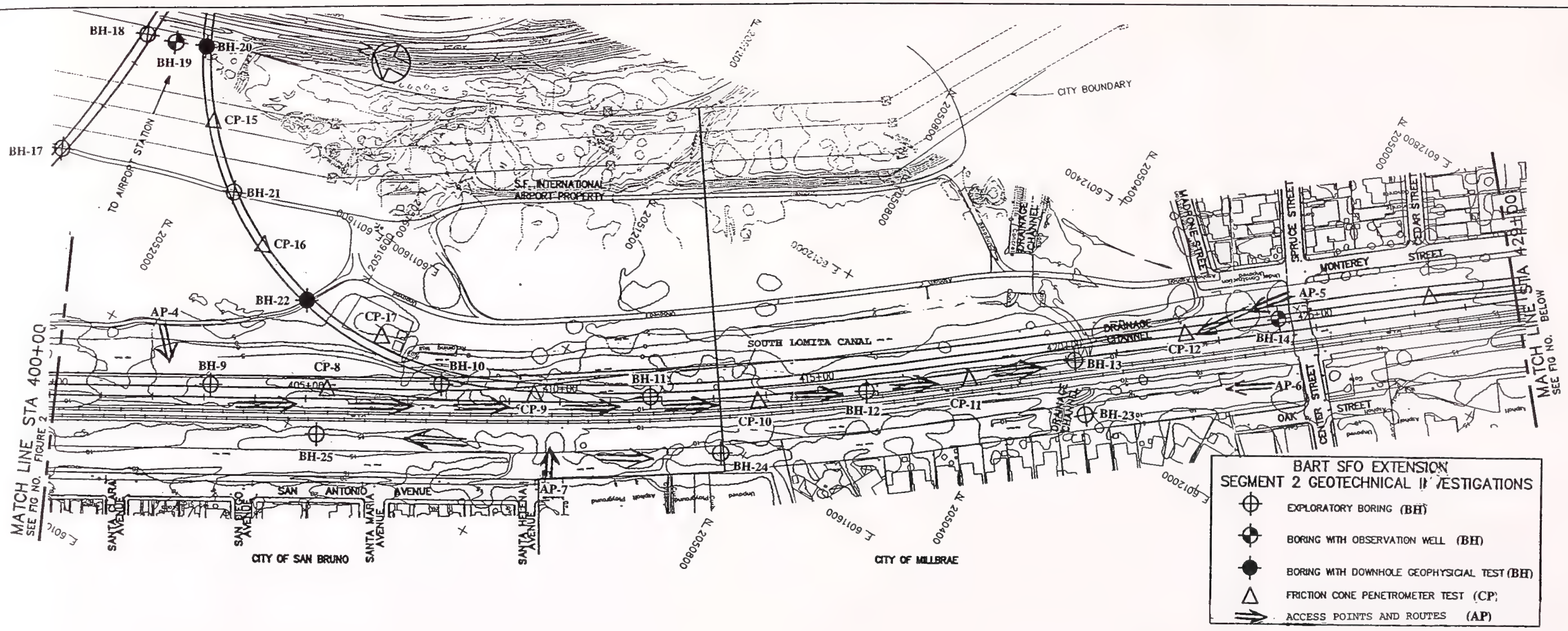
Proposed Geotechnical Test Site Locations On and In Immediate Vicinity of West-of-Bayshore Parcel

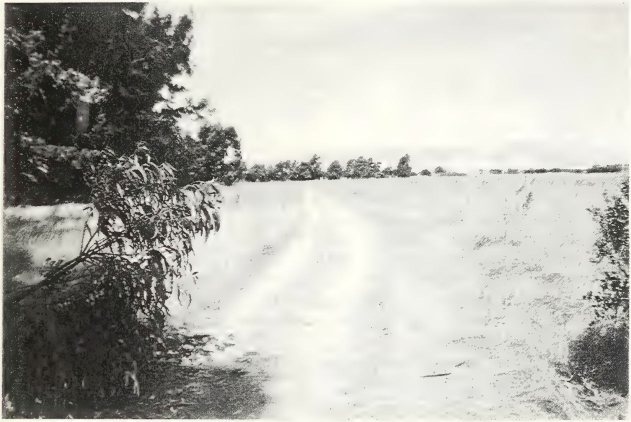
FIGURE 2-1



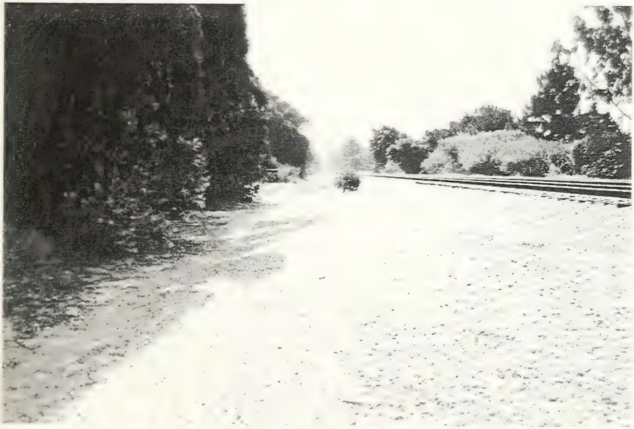
Proposed Geotechnical Test Site Locations On and In Immediate Vicinity of West-of-Bayshore Parcel

FIGURE

2-2



1: General Location of Proposed Geotechnical Test Sites



2: General Location of Modified Geotechnical Test Sites

OGDEN Photos 1 and 2: General Locations of Proposed and Modified Geotechnical Test Sites

FIGURE 3.1

4. SPECIES INFORMATION

4.1 Existing Plant Communities and Wildlife Habitats in the West-of-Bayshore Parcel

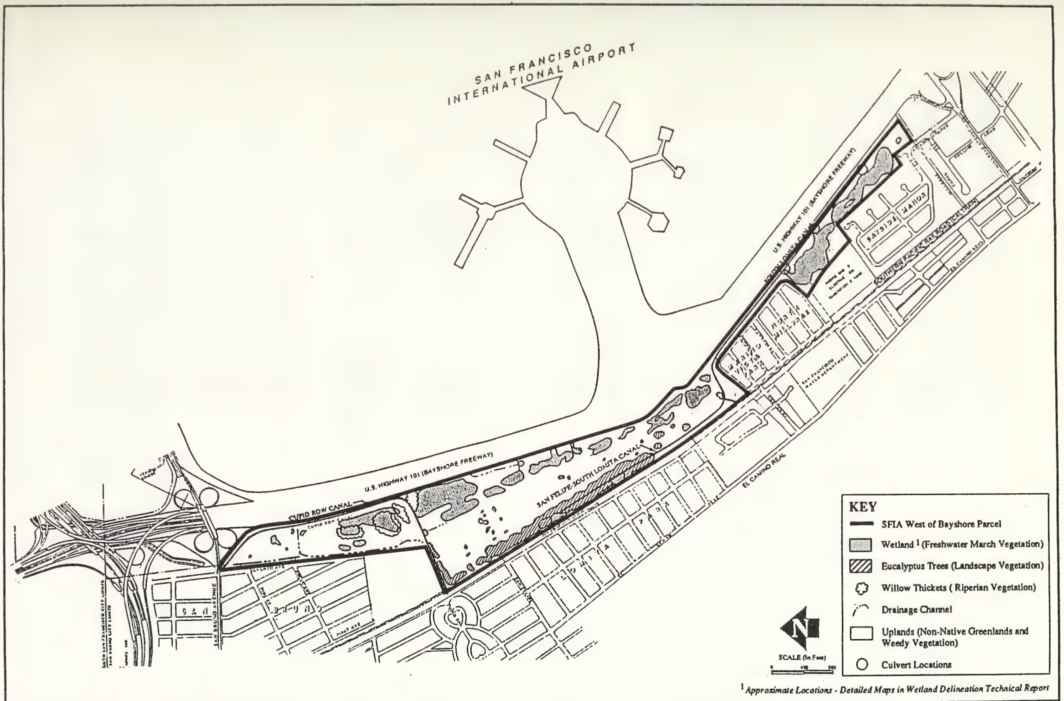
Nearly all of the west-of-Bayshore parcel was at one time part of the San Francisco baylands with salt marshes and sloughs. Between approximately 1939 and 1969 the parcel was cut off from San Francisco Bay by the Bayshore Highway and the SFIA. The parcel was drained and used for agriculture (livestock pastures and hay) until approximately 1969 when many of the sloughs and waterways were filled. The existing drainage and seasonal wetlands on the parcel have been constructed and maintained by human activities.

The vegetation communities and wildlife habitats currently occurring within the west-of-Bayshore parcel include freshwater marsh, non-native grassland, riparian vegetation, ruderal or weedy vegetation, and landscaped vegetation (see Figure 4-1). The most extensive habitats on the west-of-Bayshore parcel consist of wetlands, riparian, and non-native grasslands. The following is a brief description of the vegetation communities and wildlife habitats found within the west-of-Bayshore parcel.

Freshwater Marsh and Seasonal Wetland Vegetation (Wetland). Freshwater marsh vegetation, consisting of cattails, tules, rushes, and sedges occurs along Cupid Row and the South Lomita Canals. These perennially wet habitats support a wide variety of wildlife including the California red-legged frog and the SFGS. Seasonal wetlands occur within the topographic depressions immediately west of Highway 101, within the PG&E transmission line alignment, and in intermittent flowing channels like San Felipe Canal. These habitats are typically dominated by annual herbaceous plant species or may essentially be devoid of vegetation cover like much of the San Felipe Canal.

Riparian Vegetation (Willow Thickets). There are no extensive riparian corridors consisting of vertical tiers of vegetation within the west-of-Bayshore parcel. Riparian vegetation within this parcel of land consists of scattered arroyo willow (*Salix lasiolepis*) thickets along Cupid Row and South Lomita Canals where they are closely associated with the freshwater marsh vegetation.

Non-native Grassland (Uplands). Non-native grassland is one of the most prevalent vegetation communities within the west-of-Bayshore parcel and presently comprises approximately 30 acres of this parcel. This vegetation community is dominated by non-native annual grasses and weedy annual and perennial forbs, with scattered native wildflower species. Typical non-native plant species detected include brome grass (*Bromus* spp.), wild oat (*Avena fatua*), barley (*Hordeum* spp.), bur-clover (*Medicago hispida*), red-stemmed filaree (*Erodium cicutarium*), shepherds purse (*Capsella bursa-pastoris*), black mustard (*Brassica nigra*), yellow star thistle (*Centaurea solstitialis*), and chickweed (*Stellaria media*). Typical native species detected include Douglas' lupine (*Lupinus nanus*), California poppy (*Eschscholzia californica*), and wild hyacinth (*Dichelostemma pulchellum*). Such species are typical of open grazed lands.


SAN FRANCISCO INTERNATIONAL AIRPORT
U.S. HIGHWAY 101 (BAYSHORE FREEWAY)
SOUTH LOMITA CANAL
CUPID ROW CANAL
SAN FELIPE-SOUTH LOMITA CANAL
SOUTHERN PACIFIC RAILROAD (CALTRAIN)
EL CAMINO REAL
BAYSIDE MANOR
SAN FRANCISCO WATER DEPARTMENT
SAN BRUNO AVENUE
SAN BRUNO
FIRST AVE
KEY
SFIA West of Bayshore Parcel
Wetland 1 (Freshwater March Vegetation)
Eucalyptus Trees (Landscape Vegetation)
Willow Thickets (Riperian Vegetation)
Drainage Channel
Uplands (Non-Native Greenlands and Weedy Vegetation)
Culvert Locations
N
SCALE (In Feet)
0
450
900
1 Approximate Locations - Detailed Maps in Wetland Delineation Technical Report

OGDEN

Vegetation Communities and Wildlife Habitats on West of Bayshore Parcel

FIGURE 4-1

Ruderal (Weedy) Vegetation. Disturbed habitats are characteristically associated with land which is significantly and repeatedly altered by surface disturbances. Such habitat is typically found in vacant lots, roadsides, construction staging areas, or graded lots. The railroad right-of-way itself supports this type of plant community, and it is very common along the project alignment adjacent to the west-of-Bayshore parcel.

Common introduced or non-native plant species include mallow (*Malva* sp.), filaree (*Erodium* spp.), cut-leaf plantain (*Plantago* sp.), cudweed (*Gnaphalium* sp.), horseweed (*Conyza canadensis*), anise (*Daucus carota*), wild oats, brome grass, common thistle (*Cirsium* sp.), yellow star-thistle, mustard (*Brassica* sp.), and wild radish (*Raphanus sativus*).

Landscaped Vegetation. Landscaped vegetation, sometimes referred to as urban mix vegetation, is composed of trees and shrubs that have been planted for landscape purposes and those that have become naturalized, such as blue gum (*Eucalyptus globulus*) and acacia (*Acacia* spp.). The largest landscaped areas consist of the blue gum groves on the west-of-Bayshore parcel next to the CalTrain tracks although large landscape trees are scattered along much of the urbanized project corridor.

4.2 Listed, Proposed and Candidate Species in the Project Region

In a letter to BART, the USFWS has designated 23 candidate and/or proposed plant species, eight candidate mammal species, three candidate reptile species, three candidate and/or proposed amphibian species, five candidate and/or proposed fish species, eight candidate bird species and nine candidate and/or proposed invertebrate species that are known to occur in the project region (San Mateo County) and could potentially occur in the project corridor. Only one of these species is known to inhabit the portion of the proposed project corridor which runs through the west-of-Bayshore parcel (see Figure 4-1): the California red-legged frog *(Rana aurora draytonii)*, which was subsequently advanced to a proposed endangered status (February 2, 1994). The USFWS list also had seven plant, one mammal, one reptile, three fish, seven birds, and four invertebrate endangered or threatened species. The one listed endangered reptile, the San Francisco garter snake *(Thamnophis sirtalis tetrataenia)* is known to occur within the west-of-Bayshore parcel and this population has been monitored in recent surveys (McGinnis, 1992). None of the other listed endangered or threatened species were found in the project corridor.

Additional lists provided by the CDFG and other concerned groups as part of the comments on the AA/DEIR/DEIS for the proposed BART San Francisco Airport Extension Project (proposed project) increased the list of potential sensitive species that are known to occur in the project region. Of these additional sensitive species, only one was known to occur in the west-of-Bayshore section of the proposed project corridor: the San Francisco forktail damselfly *(Ischnura gemina)*.

A series of specific wildlife surveys have been conducted for the proposed project to supplement existing information on sensitive species known to occur on the west-of-Bayshore parcel. During 1990 and 1991, the Pacific Gas & Electric Company and MTC initiated a study of the west of Bayshore parcel to determine suitable habitat localities and estimate the San Francisco Garter Snake (SFGS) population on the site (McGinnis, 1992). In June 1991, John E. Hafernik, Jr., Ph.D., conducted a specific survey for the San Francisco forktail damselfly at the west of Bayshore parcel and north of Madrone Street (Hafernik, 1991).

A second set of specific wildlife surveys were conducted to supplement the data contained in the two surveys noted above. Dr. Hafernik's 1991 survey of the San Francisco forktail damselfly were supplemented by a specific survey of the area immediately south of the original project area. A specific survey for the California red-legged frog on the west of Bayshore parcel was performed by Michael S. Marangio in September and October 1993.

A survey was conducted for fairy shrimp in the seasonal wetlands on the west-of-Bayshore parcel and in particular for the California Linderiella *(Linderiella occidentalis)*, which is a proposed endangered species under the FESA (Entomological Consulting Services, Ltd., 1994). Although not listed in any of the correspondence or comments on the AA/DEIR/SDEIS, the project sponsors conducted the survey due to concerns over the status of fairy shrimp and the presence of seasonal wetlands on the west-of-Bayshore parcel. The results of the survey indicated that fairy shrimp do not occur in the seasonal wetlands on the site. For greater detail on the surveys conducted for sensitive species in the project corridor, the reader may refer to the AA/DEIR/DEIS and the DEIR/SDEIS, in particular to the appendices of these reports.

4.3 Sensitive Species Found on the West-of-Bayshore Parcel

A brief discussion of those sensitive species found in the west-of-Bayshore parcel is presented below.

San Francisco Garter Snake (SFGS)

Status. The SFGS (*Thamnophis sirtalis tetrataenia*) is a federally listed Endangered species. It was originally protected by listing in March 1967 (32 Federal Register 4001) and was subsequently afforded additional protection under the Federal Endangered Species Act (FESA) of 1973. The SFGS was listed in 1971 as an endangered species under the California Endangered Species Act (CESA). In 1985, the USFWS in cooperation with the CDFG published a Recovery Plan for the San Francisco Garter Snake. The following summarizes the goals and objectives of this plan to reduce the danger of extinction of the remaining populations of this federal- and state-listed endangered reptile.

- The SFGS will be considered "recovered" when 10 populations are adequately protected and each supports at least 200 adult snakes (50:50 sex ratio) for 15 consecutive years. Under these conditions, this species may be considered for delisting.

- To attain this recovery condition, it will be necessary to secure the six presently known populations, each with at least 200 adult snakes (50:50 sex ratio); protect/establish four additional populations each with at least 200 adult snakes (50:50 sex ratio); determine population levels and enhance, if necessary; implement site-specific management plans; and undertake law enforcement and public awareness efforts.

- Life history studies and habitat surveys must be completed, and population trends and habitat needs determined; specific habitat areas must be delineated, secured, and habitat management plans developed; local planning agencies must be informed of the management needs of SFGS on a site-by-site basis.

- Management/maintenance needs to ensure that the species remains in a recovered state include the successful implementation of management plans, public awareness programs, law enforcement efforts and integration of recovery plan objectives into local land use planning.

At the present time the USFWS and CDFG has initiated a revised recovery plan effort for the SFGS. The recovery team of experts has been identified and is now meeting to revise the Recovery Plan (per. com. Alison Willy, Biologist, USFWS March, 1995).

Historic and Current Distribution and Range. Historically, the SFGS has been found on the San Francisco Peninsula from approximately the San Francisco/San Mateo countyline southward to Point Año Nuevo (Barry, 1978). Fox (1951) reported 12 localities while Barry (1978) reported some 28 localities, and reported that one of localities in the Fox report (the sag ponds along Skyline Boulevard) had been destroyed by urbanization. A subsequent survey by McGinnis between 1984-1987 (1989) reported 26 localities including one in the extreme northwestern corner of Santa Cruz County. Many of the historical locations of this subspecies have been destroyed by urbanization, especially in the northern and eastern portions of its original range. Most SFGS populations that once occurred along privately owned drainages have been partly or completely extirpated by urbanization, agriculture, highway construction, roadway kills, illegal collecting and other human disturbances. Most of the extant SFGS populations are situated partly or entirely on public lands.

Threats to Populations. Alteration and isolation of habitats resulting from urbanization is the principal reason for decline of the SFGS. This includes loss and adverse modification of wetland and adjacent upland habitat by urban, industrial, and recreational development, as well as agricultural conversion, continued heavy grazing of cattle in feeding ponds and retreat sites, stream and creek channelization, removal of emergent vegetation, and rip-rapping of streambanks and shorelines. Although the geographical range of the SFGS appears to be relatively extensive, recent field surveys suggest it has a very limited and localized occurrence in San Mateo and northern coastal Santa Cruz counties (Barry, 1978, McGinnis 1989). In addition to human-caused habitat loss and alteration, collection by reptile fanciers and dealers poses a significant threat to the SFGS because of its attractive coloration.

Habitat Requirements. SFGS are observed most often in the vicinity of permanent water bodies such as ponds, lakes, marshes and sloughs (Fox, 1951). However, they also use temporary ponds and other seasonal water bodies. Emergent and bankside vegetation, such as cattails *(Typha* spp.), bulrushes *(Scirpus* spp.) and rushes *(Juncus* spp.) are apparently preferentially used for cover. The interface between aquatic habitats and grasslands with scattered shrubs is used for basking, while nearby dense vegetation or water provide escape cover. Recent field studies using radiotelemetry have shown that the SFGS use rodent burrows some distance away from standing water for shelter and escape, and low-lying marshy areas are used for feeding and reproduction (McGinnis, 1990, 1992). This work has also revealed that both summer and winter subterranean retreat areas or hibernacula may also be located in upland areas previously not believed to be preferred habitat for this species.

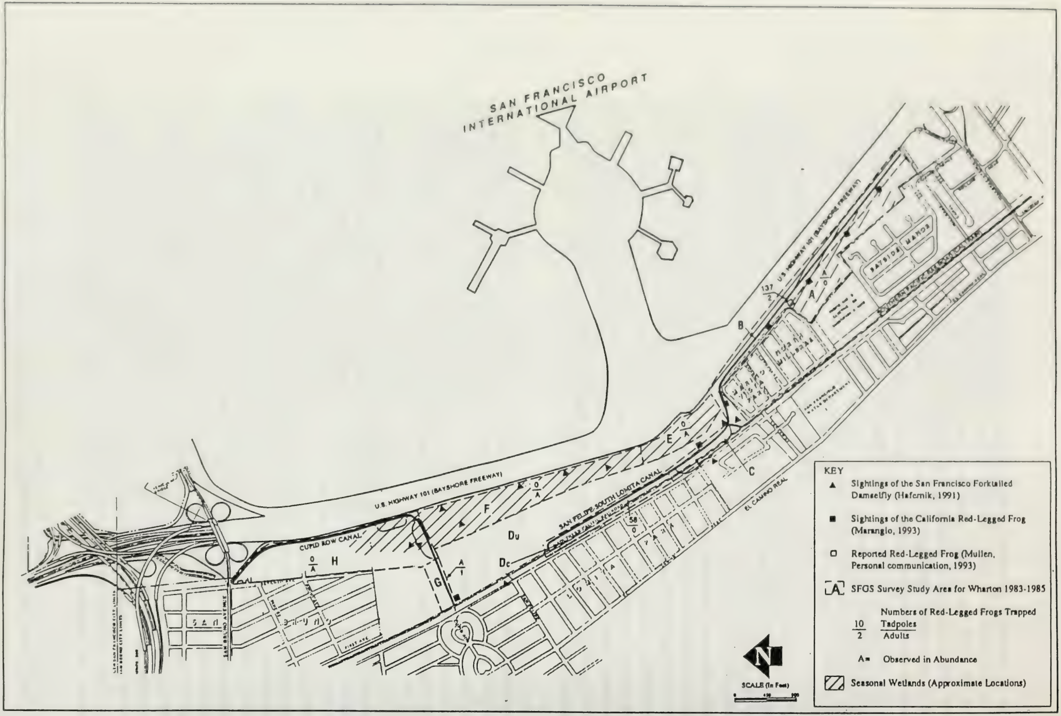
The primary prey item of the SFGS reported by Fox (1951) and Barry (1978) is the red-legged frog *(Rana aurora draytonii).* However, investigations by CDFG (Drummond, 1983) indicate that the SFGS has a more generalized diet consisting of Pacific tree frogs *(Hyla regilla),* California slender salamanders *(Batrachoseps attenuatus),* recently metamorphosed western toads *(Bufo boreas)* and bullfrogs *(Rana catesbeiana).* The three spine stickleback *(Gasterosteus aculeatus),* and the mosquito fish *(Gambusia afinis)* have also been recorded in their diet (Wharton, et al. 1987; McGinnis and Larsen, 1991). Although the SFGS itself may not be particularly sensitive to water salinity, its primary food source, frogs, are quite sensitive to salinity and do not occur in saline environments (Hydro Science, 1992).

The SFGS typically emerges from hibernation during March, and activity increases throughout spring, reaching a peak in May. In June, activity drops substantially, then remains relatively stable throughout the summer. In September, activity again drops and remains low throughout the fall. Almost no activity occurs during winter, except for brief periods on sunny days.

Little is known of the seasonal movements of the SFGS. It is presumed that individual SFGS have definite home ranges, determined largely by site conditions (i.e., availability of food, cover, etc.) as discussed by Stickel and Cope (1947). SFGS movements of 900 and 1,225 feet have been recorded in radio telemetric studies conducted at the west-of-Bayshore parcel (McGinnis and Larsen, 1991). In both instances, SFGS remained within an area of less than 100 feet in diameter after their migratory trips. Nearly all of the SFGS activity was centered along the banks of the larger canals on the site. When sojourns were made away from the banks, they were always to retreat sites in upland areas within 40 feet of the upper bank edge.

Reproduction. The reproductive cycle of SFGS was studied by Fox (1952, 1954) and found to be similar to other Pacific coast subspecies of *T. sirtalis* (Stewart, 1968). Mating occurs either in the spring or fall but is especially concentrated in the first few warm days of March. Ovulation in T. *sirtalis* generally occurs in late spring. Gestation takes place in early summer, and birth of young occurs from July to August. Like most garter snakes, *T. sirtalis* is ovoviviparous, producing from three to 85 young, with an average litter size being 12 to 24 (Fitch, 1970).

West-of-Bayshore Population Characteristics. The SFGS inhabits the entire 180 acres of the west-of-Bayshore parcel, and has been found in the following five general areas as defined by Wharton (1988), and McGinnis and Larsen (1991), and indicated in Figure 4-2: the seasonal wetlands at the southern end of the parcel (Area A), all along and within the southern portion of South Lomita Canal (Area B), all along and in the San Felipe–South Lomita Canal (Areas Dc and C), within the uplands between San Felipe–South Lomita Canal and the seasonal wetlands next to the Bayshore Freeway (Area Du), within the seasonal wetlands immediately west of the Bayshore Freeway (Areas E and F), in and along Cupid Row Canal (Area G) and south of San Bruno Avenue and north of Cupid Row Canal (Area H). The largest numbers of SFGS individuals were reported along and in South Lomita Canal (Areas A, B and C) where aquatic habitats are available year-round. In the spring months, the seasonal wetlands immediately west of Highway 101 (Areas E and F) are typically full of water and attract the SFGS to these areas to feed. The San Felipe portion of the San Felipe–South Lomita Canal (Area Dc) is used in the spring when it is full of water as a travel corridor between Cupid Row Canal and South Lomita Canal. Cupid Row Canal at one time provided good habitat for the SFGS, but had been altered by tidal influences and increased water salinities. More recent efforts to actively manage the tidal gates at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U.S. HIGHWAY 101 (BAYSHORE FREEWAY)
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CUPID ROW CANAL
SAN FELIPE-SOUTH LOMITA CANAL
EL CAMINO REAL
SAN BRUNO AVENUE
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137
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0
KEY
▲ Sightings of the San Francisco Forktailed Damselfly (Hafernik, 1991)
■ Sightings of the California Red-Legged Frog (Marangio, 1993)
□ Reported Red-Legged Frog (Mullen, Personal communication, 1993)
[A] SFGS Survey Study Area for Wharton 1983-1985
10/2 Numbers of Red-Legged Frogs Trapped Tadpoles/Adults
A= Observed in Abundance
▨ Seasonal Wetlands (Approximate Locations)
N
SCALE (In Feet)

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Reported Locations of the SFGS, San Francisco Forktail Damselfly, and California Red-Legged Frog in SFIA Property West of Highway 101

FIGURE 4-2

the mouth of this canal have improved the habitats for the SFGS and its prey species. Trapping in Areas H and Du have resulted in the capture of only a few SFGS, indicating limited use of these areas.

During surveys conducted between May 1983 and October 1985, 635 SFGS were captured throughout the west-of-Bayshore parcel (Wharton, 1988). Based upon the results of this two—year study, the actual population of SFGS at this site was estimated at between 465 and 526 individuals. This represented the largest population of SFGS identified to date. Subsequent surveys conducted over a two year time span in 1990 and 1991 (McGinnis, 1992) concluded that the number of SFGS trapped in the same study area was significantly lower. These studies show that the numbers of SFGS had declined at this site since 1985 and that the remaining SFGS are concentrated in the area of the South Lomita Canal and the seasonal wetlands immediately west of Highway 101 during spring months in years when these wetlands fill with water.

This reduction in population was due in part to seven consecutive years of drought conditions at the time of the second study. Although one explanation for population reduction may be related to the drought, there are other contributing factors, such as:

- The intrusion of saltwater in Cupid Row Canal which alters the aquatic habitats and eliminates vegetation cover and food sources for the SFGS in this canal.
- The introduction of non-native predator species (e.g., bullfrog) to the site which may have significantly reduced the principal food source (i.e., red-legged frog) for the SFGS.
- Continued risks to SFGS individuals from illegal collectors and vehicular traffic, despite continued efforts by SFIA to secure the area.
- Ground level entryways to underground culverts in which individual SFGS enter and cannot escape.

If these conditions were to persist on the west-of-Bayshore parcel, the USFWS has expressed concern regarding the welfare of the resident SFGS population (per. com. Alison Willy, Biologist, USFWS, 1995).

California Red-Legged Frog

Status. The California red-legged frog (*Rana aurora draytonii*) has been proposed for listing as endangered under the FESA (Federal Register, February 2, 1994), and is a California "Species of Special Concern.".

Historic and Current Distribution and Range. The red-legged frog occurs west of the Sierra-Cascade crest and in the Coast Ranges along the entire length of the state. It has apparently been extirpated in the Central Valley of California. A study of known red-legged frog sites in the Central Valley and foothills found this species to be extinct in over 50% of the Central Valley drainage systems where it was historically recorded (Hayes and Jennings 1988).

Threats to Populations. Much of the habitat of the red-legged frog has undergone significant alterations in recent years, leading to extirpation of many populations. Causal factors in the continuing decline of this species is poorly understood. Insufficient understanding of red-legged frog habitat requirements has been the main problem in identifying their decline (Hayes and Jennings 1986). Factors that have been proposed as contributing to its decline include its former exploitation as food (Jennings and Hayes 1985), predation or competition by the introduced bullfrog (*Rana catesbeiana*), fish predation (Moyle 1973), and habitat modification (Hayes and Jennings 1986, 1988). Red-legged frogs and bullfrogs occasionally occupy the same aquatic habitat in coastal areas, but are not known from the same locale in the Sierra Nevada Mountains and foothills (per. com. Mark Jennings, 1992).

Habitat Requirements. The red-legged frog inhabits quiet pools in marshes and streams and in ponds. It is closely tied to its aquatic environment, and is generally associated with permanent and intermittent streams. Shrubby willows are often found at sites where they are found. They are generally found on streams having a small drainage area and low gradient (Hayes and Jennings 1988). Adults feed on aquatic and terrestrial insects, crustaceans, snails, worms, small fish, and tadpoles, as well as smaller frogs.

Reproduction. This species' reproductive season spans January to March (Stebbins 1962). Females deposit 2,000 to 4,000 eggs in permanent or nearly permanent pools.

West-of-Bayshore Population Characteristics. Based on past and more recent field surveys on the west-of-Bayshore parcel, it appears that population levels and suitable habitats for the California red-legged frog are declining. Surveys in 1984 and 1985 for the SFGS (Wharton 1988), noted that red-legged frog tadpoles and adults were "in abundance" in the wetland areas associated with and in Cupid Row Canal. In a 1993 survey (Marangio, 1993), only two adult red-legged frogs were found in a short reach at the western end of Cupid Row Canal and the remaining aquatic habitat was not suitable due to increased salinity levels. Red—legged frogs were also found in this study along the entire length of South Lomita Canal (see Figure 4-2). In addition to the red-legged frog, the 1993 survey revealed an abundance of bullfrogs throughout the aquatic habitats of the west-of-Bayshore parcel. There was no historic information available on the abundance of bullfrogs on this site prior to this survey.

San Francisco Forktail Damselfly

The San Francisco forktail damselfiy (*Ischnura gemina*) is a candidate for listing as endangered or threatened under the FESA. This species is associated with seepages, ponds, and slow-moving streams or canals. A survey, conducted in September and October 1993 on the west-of-Bayshore parcel between the North Millbrae community and the Millbrae Canal to the south concluded that current conditions do not appear adequate to support a breeding population (Hafernik, 1993b). This survey did reconfirm an earlier survey (Hafernik, 1993a) indicating that active, adult breeding populations of the San Francisco forktail damselfly still exist in the seasonal wetlands just west of the Bayshore Freeway and in northern portions of the South Lomita Canal (see Figure 4-2). The best breeding habitat for this insect is in the large seasonal wetland at the northern end of Area F, since this large seasonal wetland retains water longer than any other wetland in the west-of-Bayshore parcel.

5. EFFECTS OF THE PROPOSED ACTION

5.1 Direct Effects

1. The geotechnical field investigations would temporarily disturb a little more than approximately 0.24 acres of upland habitat.

It is estimated that approximately 300 square feet of area would be temporarily disturbed at each bore hole site. The 24 bore hole locations proposed for this initial field investigation program would temporarily disturb approximately 7,200 square feet or 0.17 acres of upland habitat. The 24 proposed test sites will be located within existing roadways or at the base of the railway ballast along the CalTrain tracks.

It is estimated that an area of approximately 240 square feet would be temporarily disturbed at each cone penetrometer site. The 3 cone penetrometer test sites proposed for this initial field investigation would disturb approximately 3,120 square feet or 0.07 acres of upland habitat.

Additional areas of impact would occur due to the lack of direct accessibility of some of the test sites existing roads. This would necessitate the need for some off-road travel on and in the immediate vicinity of the west-of-Bayshore parcel. Proposed travel routes and access points to those test sites not located on roadways are illustrated in Figures 2-1 and 2-2. The proposed access points have been selected to avoid the need to cross wetland habitats to the greatest extent possible. Access points 3 and 4 will require the crossing of San Felipe Canal, but these crossings will be done on crib type bridges spanning the channel.

The surface disturbances associated with the proposed activities would pose a threat to any SFGS on the ground surface. Vehicular travel and movements on the west-of-Bayshore site could result in the crushing of individual SFGS basking on roadways or hiding within the brush or grasslands. However, the proposed action is expected to be conducted in the winter (December or January) when SFGS activity on the site is low, and the potential for conflicts is expected to be low as well.

2. The movements, feeding, and breeding activities of the SFGS may be inhibited by the proposed actions.

Disturbances above ambient noise and activity levels may preclude SFGS from foraging in areas or cause SFGS to move out from beneath protective cover into unprotected habitats and thus become more susceptible to predation. This type of potential impact is most likely to occur on the eastern side of the west-of-Bayshore parcel where a large seasonal wetland is located and along South Lomita Canal. The testing sites located in these areas may temporarily disturb SFGS use of these wetlands for a maximum of six to eight hours in the case of a soil boring site.

5.2 Cumulative Effects

The west-of-Bayshore parcel is owned by the San Francisco International Airport (SFIA). Although the San Francisco City and County did not identify any specific development plans for this undeveloped parcel of land in its Airport Master Plan (1989), potential development of an intermodal transportation station or center located on this parcel at some point in the future was indicated. SFIA planning staff have indicated that the Airport hopes to use this parcel of land to help meet future expansion needs (per com. John Costas, San Francisco International Airport 1995). Other potential projects on the west-of-Bayshore parcel would include a gas pipeline extension through a portion of the site (Mojave Pipeline Project), an emergency sewer line repair project for the City of Millbrae, and a PG&E powerline extension project to the Airport. The Millbrae sewer line project and Mojave Pipeline project have completed their Section 7 consultations and the sewer line project has just recently been completed. PG&E is now in informal consultation with the USFWS.

At the present time, impacts to the SFGS and red-legged frog populations are occurring as a result of unauthorized activities as well as site maintenance practices. Vehicle traffic is common on the west-of-Bayshore parcel in support of various maintenance activities including mosquito abatement, flood control maintenance of Cupid Row and South Lomita Canals, fire and security control and maintenance activities associated with the PG&E powerlines and natural gas facilities. Unauthorized activities observed on the parcel include trespassing by vehicles, recreationists and even reported poaching of individual SFGS. All these activities combine to threaten the SFGS and red-legged frog populations on the site by either injuring or killing individual snakes and frogs (i.e., snakes may potentially be run-over by vehicles) or by removing or altering their habitats (i.e., clearing of vegetation in the canals for flood control).

6. MITIGATION MEASURES TO MINIMIZE POTENTIAL IMPACTS TO SFGS

During the approximate twenty-eight day field investigation period, the following mitigation measures will be observed to minimize and/or avoid impacts to the SFGS.

1. Implementation of a Biological Monitoring Program. A Biological Monitoring Program will be implemented. All elements of this program will require approval of and agreement with the USFWS, BART, and the geotechnical contractor. Elements of this program will include the following:

- A qualified monitoring biologist will be on the site at all times and have the authority to cease work if he/she should determine that the field investigations are not in compliance with the other mitigation efforts noted below. The monitoring biologist will contact BART and BART is to notify the USFWS within one hour of a cease-work order and/or if any SFGS are observed near a test site.

- All wetlands in the immediate vicinity of the proposed test sites will be marked with brightly colored flagging, and the biology monitor will instruct the contractor to avoid these flagged areas to prevent accidental disturbances of the wetlands.

- The field crews will participate in a training program to inform them of their responsibilities, and the sensitivity of the resources. This will include the following.

  - An on-site meeting involving all on-board personnel to ensure each person understands what can and cannot be done, reporting procedures, and responsibilities.
  - All personnel will be informed on how to recognize the SFGS or at least be aware of what it looks like, and immediately report their finding to the monitoring biologist.
  - Educate the personnel on the sensitivity of the site and in particular specific areas to be avoided, such as wetlands.

- Vehicle travel will not be allowed in wetland habitats
- All vehicle travel will be limited to existing roads to the greatest extent possible, no off-road travel will be allowed other than for direct access to a given test site. Vehicles will turn around at intersections only and there will be no short-cuts.
- All travel off-road will be limited to one route to and from the test site.
- A speed limit of 5 miles per hour will be observed at all times on the west-of-Bayshore parcel
- The monitoring biologist will check under all vehicles that have not been moved on the site for more than one half hour to make sure no SFGS have moved beneath these vehicles. If a SFGS is found, the vehicle will not be allowed to move until the monitoring biologist has removed the snake.
- Prior to vehicle access to a given test site, the monitoring biologist will inspect the site and immediate surroundings for rodent burrows. If necessary, the monitoring biologist will remove all herbaceous vegetation to within four inches of the ground surface to facilitate the inspection. A motorized, monofiliment line, weed cutter may be used to clear the vegetation within four inches of the ground surface. If rodent burrows are found in the immediate area the burrows are to be clearly marked with flagging, and an alternative test site without rodent burrows will be selected, within the parameters noted in Mitigation Measure 2 below.
- All entry gates to the west-of-Bayshore parcel will be locked and closed at all times to control access by unauthorized personnel.
- Vehicle or equipment leveling will be by jacks rather than by leveling of the ground.
- All debris and waste materials will be removed from each test site at the conclusion of work at that location before moving on to the next test site.
- All cuttings from the soil borings will be placed into appropriate waste containers or barrels and removed from the site.
- All refueling of vehicles will be conducted off-site.

- Port-O-Lets will be required on the site and secured.

- The backfilling of soil boring holes will be done at a speed that will prevent bridging.

- Biodegradable, non-toxic polymers will used to fill all holes after soil borings are completed.

- Geotechnical crews will contain all slurry from the soil boring holes and no salts will be allowed in the slurry.

- The monitoring biologist and crew chief will conduct periodic inspections of the equipment prior to entering the west-of-Bayshore parcel to check for leaks and to make sure they are in good operating condition.

- The monitoring biologist will report any unauthorized vehicle or bicycle traffic on the west-of-Bayshore parcel to Airport Security and or the local City police.

- The monitoring biologist will conduct site audits after the work is completed to assure the sites have recovered adequately and the soil boring holes have not washed-in creating steep depressions.

- The monitoring biologist will document all activities with before and after photographs, and a written report.

- For the most part, reclamation of the test sites would be performed during the field investigations with implementation of the measures noted above. However, in the event of an accidental disturbance of a wetland, an active revegetation plan and erosion control plan will be developed and implemented for the disturbed site.

- Tools and materials will be available to clean up any spills or drips. This equipment will include absorbent material, shovels, and plastic bags.

- All spill locations will be identified on a map and flagged in the field to assist in follow-up inspections.

- SFGS will not be handled with bare hands except by a person currently named under an existing section 10 permit. BART will identify to the USFWS a qualified person to handle any SFGS, prior to the initiation of the field investigation.

- If a live or injured SFGS is captured, the USFWS will be notified within 30 minutes of the capture. For injured or dead snakes, the certified biologist will attempt to determine the extent of injuries and how the snake was injured or killed. The USFWS will determine what course of action is to be taken at that point.

2. *Provide Adequate Buffer Zones from Wetland Habitats and Areas on Other Sites in the west-of Bayshore Parcel.* Wetland and SFGS habitat buffer zones will be implemented as follows:

- A 50-foot buffer zone will be established around the seasonal wetland habitats immediately west of Highway 101. All testing activities will be conducted outside of this 50-foot buffer zone.

- A 200-foot buffer zone will be established around all bush species found on the west-of-Bayshore parcel, particularly around coyote bush (*Baccharis* sp.) plants. Sensitive habitats associated with coyote bush will be flagged and identified as avoidance areas.

- Certain bore holes will be limited in proximity to coyote bush present on the site as follows:
  - BH-17 will be moved 75 feet north from the proposed location indicated in Figure 2-2);
  - BH-21 will be moved to a location that is 50 feet from the nearest coyote bush to the north and 75 feet from the nearest coyote bush to the south; and
  - BH-22 will be moved 50 feet north from the proposed location indicated in Figure 2-2.

7. DETERMINATION OF EFFECT

Based upon the effect analysis and conservation measures described above, it is determined that the proposed BART extension project to the SFIA would be either "no effect" or "not likely to adversely effect" the SFGS, California red-legged frog, and San Francisco forktail damselfly on the west-of-Bayshore parcel.

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APPENDIX A

BART - San Francisco Airport Extension
Wye Stub Option
Field Geotechnical Investigation Program

APPENDIX A
BART–SAN FRANCISCO AIRPORT EXTENSION
WYE STUB OPTION
FIELD GEOTECHNICAL INVESTIGATION PROGRAM

For the BART–SFO Airport Extension Wye Stub Option, it is proposed to carry BART Tracks by aerial structure from the existing mainline right-of-way, eastward across undeveloped Airport property which includes wetlands areas, and into the San Francisco International Airport.

Geotechnical field investigations, consisting of exploratory soil borings and cone penetrometer tests, will be required to obtain the soils information needed for foundation design. Proposed test locations within the west-of-Bayshore parcel and the contiguous mainline right-of-way have been selected specifically to avoid designated wetlands areas. The proposed program includes twenty-eight exploratory borings and seventeen cone penetrometer tests located as follows:

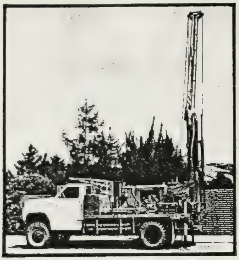
LOCATION	# of Borings	# of Cones
SFIA West-of-Bayshore Parcel	7	5
Mainline Right-of-Way	15	12
SFO Water Department Right-of-Way	6	0
	28	17

The "best estimate" of time required to complete the field work is twenty eight working days for the entire program. Access to test sites will be via by existing roadways and across upland areas at selected points. It should be noted that the majority of borings and cones have been located in or directly adjacent to existing roadways and outside of the west-of-Bayshore parcel to minimize disturbance of San Francisco Garter Snake (SFGS) habitat. These locations have been adjusted in the field where necessary to avoid sensitive areas.

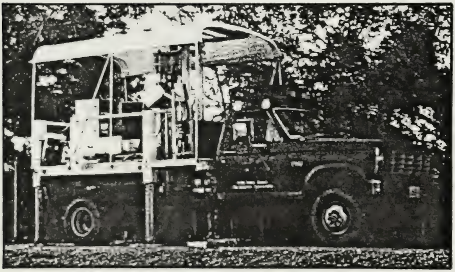
The exploratory soil borings will be eight inches in diameter and 50 to 100 feet deep. Soil samples will be collected for laboratory testing. Temporary PVC casing will be installed in selected borings to allow monitoring of groundwater levels and for downhole geophysical testing to determine dynamic soil properties for earthquake design. For these borings, lockable metal covers (Christy Boxes) will be installed over the casing and flush with the ground surface. The drilling equipment will be mounted on a single-axle, four wheel drive truck with maximum gross vehicle weight of 16,000 pounds (Photograph 1). The drill rig may be accompanied by a small water truck or water trailer. Engine noise for the rig is similar to a small backhoe or tractor. Each boring will require about six hours from start to finish. Samples will be taken about every 20 minutes by driving a sample tube into the soil with hammer blows similar to the sound of a sledge hammer striking a metal plate. Jobsite personnel will include a driller, driller's helper, engineer, and biological monitor for a total of four people.

Cone penetrometer test holes will be two inches in diameter and up to 100 feet deep. The test equipment will again be mounted on a single-axle, four wheel drive truck with maximum gross vehicle weight of 16,000 pounds (Photograph 2). Engine noise for the rig is similar to a standard small highway truck. Each test will require about one hour from start to finish. There will be no sampling noise with this rig. Jobsite personnel will include an operator, engineer, and a biological monitor for a total or people.

Both exploration methods are unobtrusive and will cause very little or no ground disturbance. Excess drill cuttings will be collected and disposed of offsite. Upon completion of testing and monitoring, all holes will be backfilled to the ground surface with a non-toxic polymer grout. All activities will be planned and executed to limit site disturbance to an absolute minimum. There will be no on-site fueling of equipment.



PHOTOGRAPH 1 - TYPICAL DRILL RIG



PHOTOGRAPH 2 - TYPICAL CONE PENETROMETER RIG

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Sacramento Field Office
2800 Cottage Way, Room E-1803
Sacramento, California 95825

IN REPLY REFER TO:

In Reply Refer To:
1-1-96-I-324

January 19, 1996

RECEIVED
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SFO AIRPORT
EXTENSION

Ms. Kathleen Pahl
Project Manager, San Francisco
Airport Extension
BART District
1000 Broadway, 4th Floor
Oakland, California 94604

Subject: Biological Assessment for the Bay Area Rapid Transit District Geotechnical Field Investigation Program, San Francisco International Airport West-of-Bayshore Parcel, San Mateo County, California

Dear Ms. Pahl:

The U.S. Fish and Wildlife Service (Service) has reviewed the Biological Assessment for the Bay Area Rapid Transit District (BART) Geotechnical Field Investigation Program of November 1995, which we received on November 13, 1995. The Service has determined that the proposed action, a geotechnical field investigation involving 24 exploratory soil borings and 17 cone penetrometer tests, is not likely to adversely affect the San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), providing that both the measures identified in the biological assessment and the measures agreed to during the November 2, 1995, site visit between Caltrans and members of my staff, are followed. The measures agreed to in the site visit are:

1. All vehicle travel will be limited to existing roads. In the event that off-road vehicle travel is necessary, BART shall contact the Service and receive authorization before the travel may commence.
2. All vehicle turnarounds will occur at existing intersections.
3. Only biodegradable, non-toxic polymers will be used as additives in the bentonite slurry.
4. Geotechnical crews will contain all slurry from the soil boring holes and no salts will be used in the slurry.
5. All holes will be backfilled with cement grout.
6. A speed limit of 5 miles per hour will be observed at all times on the West-of-Bayshore parcel.
7. All refueling of vehicles will be conducted off-site.
8. The eight bore holes (BH 6 through BH 13) and six cone penetrometer test sites (CP 6 through 11) that are to be moved

from along a dirt roadway on the west-of-Bayshore parcel to along the CalTrain right-of-way west of the fenceline and east of the tracks (see Biological Assessment page 2), will be located at the base of the toe of the railroad bed slope.

It is our understanding that the geotechnical investigation is required to obtain information for the future expansion of BART Service to the San Francisco International Airport. The determination in this letter only addresses the geotechnical investigation and does not represent the Service's position concerning the BART expansion. That action will require further consultation pursuant to section 7 of the Act. Therefore, unless (1) new information reveals effects of the proposed geotechnical field investigation that may affect listed species in a manner or to an extent not considered, (2) the agency action is subsequently modified in a manner that may effect a listed species or critical habitat, or (3) a new species or critical habitat is designated that may be affected by the proposed project, no further action pursuant to the Endangered Species Act of 1973, as amended, is necessary.

Please contact Ms. Kelly Geer of my staff at (916) 979-2752, if you have questions regarding this response.

Sincerely,

Joel A Medlin

Joel A. Medlin
Field Supervisor

Enclosure

cc: ARD, Klamath and California Ecoregions, Region 1, Portland, Oregon
John Costas, San Francisco International Airport
Carl Wilcox, CDFG, Region 3, Yountville
Stewart Taylor, Federal Transit Authority
FWS-SFO, Wetlands Branch, Sacramento, CA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
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IN REPLY REFER TO:

RECEIVED
[illegible] 05 1996
P. TAKIS SALPEAS
SFO AIRPORT
EXTENSION

In Reply Refer To:

1-1-96-I-696

March 28, 1996

Ms. Kathleen Pahl
lanning ~~Project~~ Manager, San Francisco
Airport Extension
BART District
1000 Broadway, 4th Floor
Oakland, California 94604

Subject: Off-Road Travel to Access Boring Sites as Part of the Proposed BART Geotechnical Survey, West-of-Bayshore Parcel, City of Milbrae, San Mateo County, California

Dear Ms. Pahl:

This letter responds to the memorandum (memo) received in our office on March 21, 1996, from Mr. Ric Villaseñor of Ogden Environmental and Energy Services Company, which clarified the nature of off-road travel to access certain boring sites as part of the geotechnical survey for the proposed BART extension. The U.S. Fish and Wildlife Service (Service) has reviewed the material provided with the memo, along with the November 1995 Biological Assessment for the project. The Service concurs that access to bore holes using access points (AP) 2, 3 and 4 (memo location numbers 1-3, 4-6, and 7-8, respectively) is not likely to adversely affect the San Francisco garter snake or California red-legged frog providing the mitigation measures identified in the above-mentioned documentation are followed.

Your memo also discusses the possible need to do limited thinning or clearing of blackberry thickets to access bore sites located at the base of the CalTrain tracks. The bore hole sites which may require some clearing to access, the extent of clearing necessary, and the method of clearing are not specified in the materials provided. The Service is concerned that clearing of vegetation in some areas may have an adverse affect on the San Francisco garter snake and, therefore, will not issue a blanket authorization for vegetation clearing. If it is determined that clearing of vegetation is necessary to access certain bore sites, BART should contact the Service in advance and receive approval for clearing activities on a site by site basis.

If you have any questions regarding this letter, please contact Ms. Kelly Geer of my office at (916) 979-2752.

Sincerely,

for Joel A. Medlin
Field Supervisor

cc: ARD, Klamath and California Ecoregions, Region 1, Portland, Oregon

BART–San Francisco Airport Extension Project

Biological Assessment for the San Francisco Garter Snake and the California Red-legged Frog

Submitted to:

U.S. Fish and Wildlife Service
Sacramento Field Office
Endangered Species Division
2800 Cottage Way, Room E-1803
Sacramento, California 95825

Submitted by:

San Francisco Bay Area Rapid Transit District (BART)
1000 Broadway
Oakland, California 94607

and

Ogden Environmental and Energy Services Company
343 Sansome Street, Suite 700
San Francisco, California 94104
(415) 981-9800

On behalf of

Federal Transit Administration (FTA)

January 1996

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1. INTRODUCTION

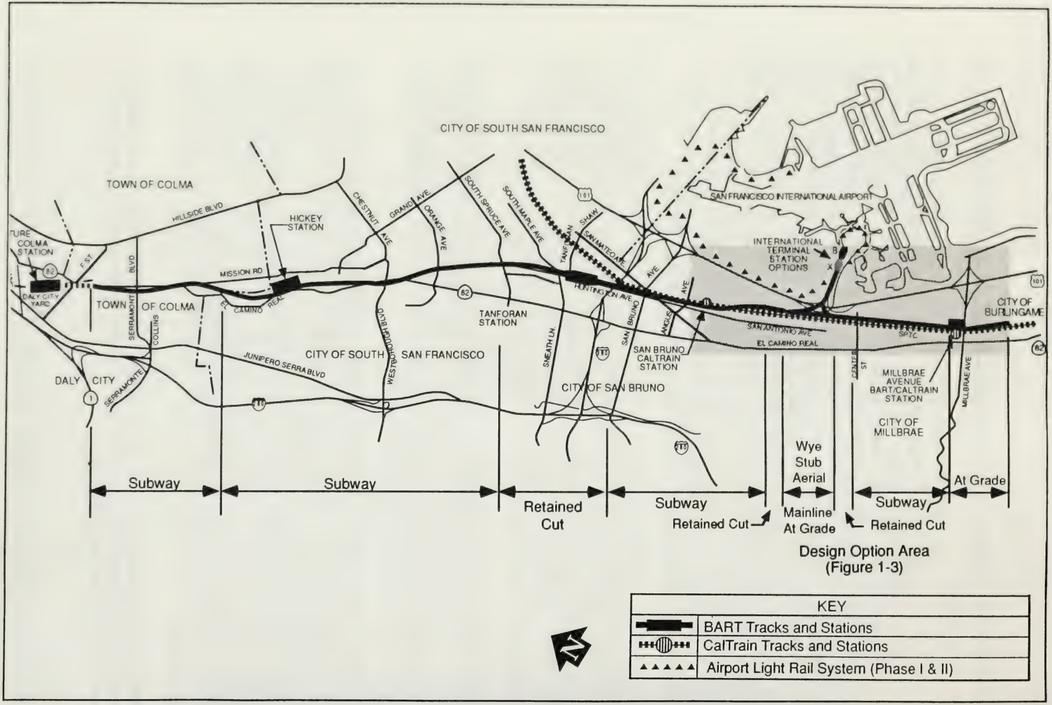
This Biological Assessment (BA) has been prepared for the proposed San Francisco Bay Area Rapid Transit District (BART) Extension to the San Francisco International Airport (SFIA). BART was given the responsibility of meeting Federal Transit Administration [FTA] the federal lead agency responsible for the project) requirements in the formal Section 7 consultation process in a letter dated January 27, 1995. The proposed Project (hereinafter referred to as the BART Extension) extends from the existing Colma Station to the SFIA. This document addresses the Alternative VI Aerial Design Option to the SFIA. (As this design option is the Locally Preferred Alternative, it is subject to possible selection as the Project by the BART and San Mateo County Transit District [SamTrans] boards and approval by FTA with certification of the FEIR/FEIS.) This BA is being submitted prior to selection of the Project to meet the NEPA/404 MOU, which requests that preliminary agreement on mitigation for endangered species be included in the FEIS. If the Locally Preferred Alternative, which is reflected herein, is not selected and approved as the Project, the requisite documentation to update this BA would be submitted to the U.S. Fish and Wildlife Service (USFWS).

The purpose of this BA is to evaluate and document potential impacts of the BART Extension on Federally listed endangered and/or threatened species; species which are candidates for listing as endangered or threatened, and any critical habitat listed by the USFWS under the Federal Endangered Species Act (FESA) that occurs within the BART Extension project corridor. For purposes of description and analysis, the "project corridor" encompasses all lands generally within one quarter mile of the proposed BART Extension alignment. This Biological Assessment meets the requirements of Section 7 of the FESA (19 USC 1536 [c], 50 CFR 402.12 [f] and 402.14 [c]).

The project corridor is located in northern San Mateo County and extends nearly eight miles from the southern terminus of the existing BART tracks in an unincorporated area of the Town of Colma. The corridor extends south through the Town of Colma and the cities of South San Francisco, San Bruno, a small portion of unincorporated San Mateo County owned by SFIA, the City of Millbrae, and the northern portion of the City of Burlingame (Figure 1-1).

Although the project corridor is approximately eight miles long, there is only one portion of the corridor that supports wildlife species that are under the jurisdiction of the FESA. This is the 180 acre parcel of land immediately west of the Bayshore Freeway, or Highway 101, that is owned by the SFIA (hereinafter referred to as the "west-of-Bayshore parcel") as depicted in Figure 1-2. This parcel of land supports the endangered San Francisco garter snake *(Thamnophis sirtalis tetrataenia*), the California red-legged frog (*Rana aurora draytonii*) which is proposed for listing as endangered under the FESA (Federal Register, 1994), and the San Francisco forktail damselfly (*Ischnura gemina*) which is a candidate for listing as endangered or threatened under the FESA. There are no endangered, threatened or candidate plant species, or designated critical habitats identified within the project corridor.

There have been a number of environmental studies conducted and documents prepared in support of the proposed BART extension project. Those studies and reports most applicable to the information provided in this BA include the following:



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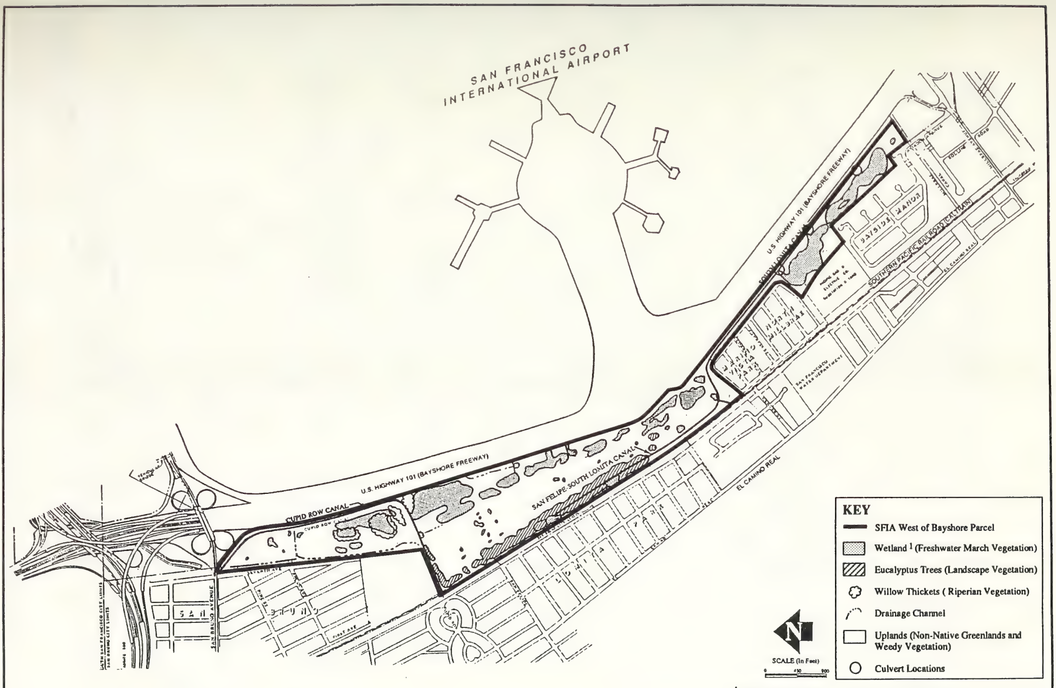
Alternative VI Project Corridor with Aerial Design Option Area

FIGURE 1-1


SAN FRANCISCO INTERNATIONAL AIRPORT
U.S. HIGHWAY 101 (BAYSHORE FREEWAY)
CUPID ROW CANAL
SAN FELIPE-SOUTH LONITA CANAL
SOUTH LONITA CANAL
SOUTHERN PACIFIC RAILROAD (CALTRAIN)
EL CAMINO REAL
SAN BRUNO AVENUE
SAN FRANCISCO WATER DEPARTMENT
BAYSIDE MANOR
NORTH MILLBRAE
SAN BRUNO
LOMITA PARK
KEY
SFIA West of Bayshore Parcel
Wetland 1 (Freshwater March Vegetation)
Eucalyptus Trees (Landscape Vegetation)
Willow Thickets (Riperian Vegetation)
Drainage Channel
Uplands (Non-Native Greenlands and Weedy Vegetation)
Culvert Locations
N
SCALE (In Feet)
0
450
900

[1] *Approximate Locations - Detailed Maps in Wetland Delineation Technical Report*

Vegetation Communities and Wildlife Habitats on West-of-Bayshore Parcel

FIGURE

1-2

- An Alternatives Analysis/Draft Environmental Impact Statement/Draft Environmental Impact Report (AA/DEIS/DEIR) was completed in March of 1992. The AA/DEIS/DEIR presented a screening and refinement of a number of project alternatives and documented the environmental consequences of each alternative. From this report, BART, SamTrans, and the Metropolitan Transportation Commission (MTC) selected a "Locally Preferred Alternative" (LPA). more detailed preliminary engineering and environmental documentation has been undertaken for the LPA.

- A new DEIR and a Supplemental Draft EIS (SDEIS) was released in January 1995 (DEIR/SDEIS) by BART, SamTrans and the FTA in response to technical issues raised in the review of the AA/DEIS/DEIR, and to present a number of newly identified alternatives that were not analyzed in the AA/DEIS/DEIR. The DEIR/SDEIS contains an analysis of the environmental consequences for each alternative, as well as appended technical reports on the three sensitive species addressed in this Biological Assessment.

- A Focused Recirculated Draft Environmental Impact Report/Supplement #2 Draft Environmental Impact Statement (FRDEIR/S#2DEIS) was prepared and released in September 1995. This document evaluated two new design options to Alternative VI (the selected LPA). Consideration of these additional options was prompted by recent actions of the U.S. Congress, BART, and San Francisco Airport Commission related to projected costs and implementation of the 1989 San Francisco International Airport Master Plan. Both of the additional options included an aerial "wye-stub" alignment through the west-of-Bayshore parcel and a mainline track alignment immediately east of the CalTrain tracks along the western border of the west-of-Bayshore parcel. This BA addresses the project elements of these two options that involve the west-of-Bayshore parcel. The reader should refer to the FRDEIR/S#2 and DEIS for more details on these options.

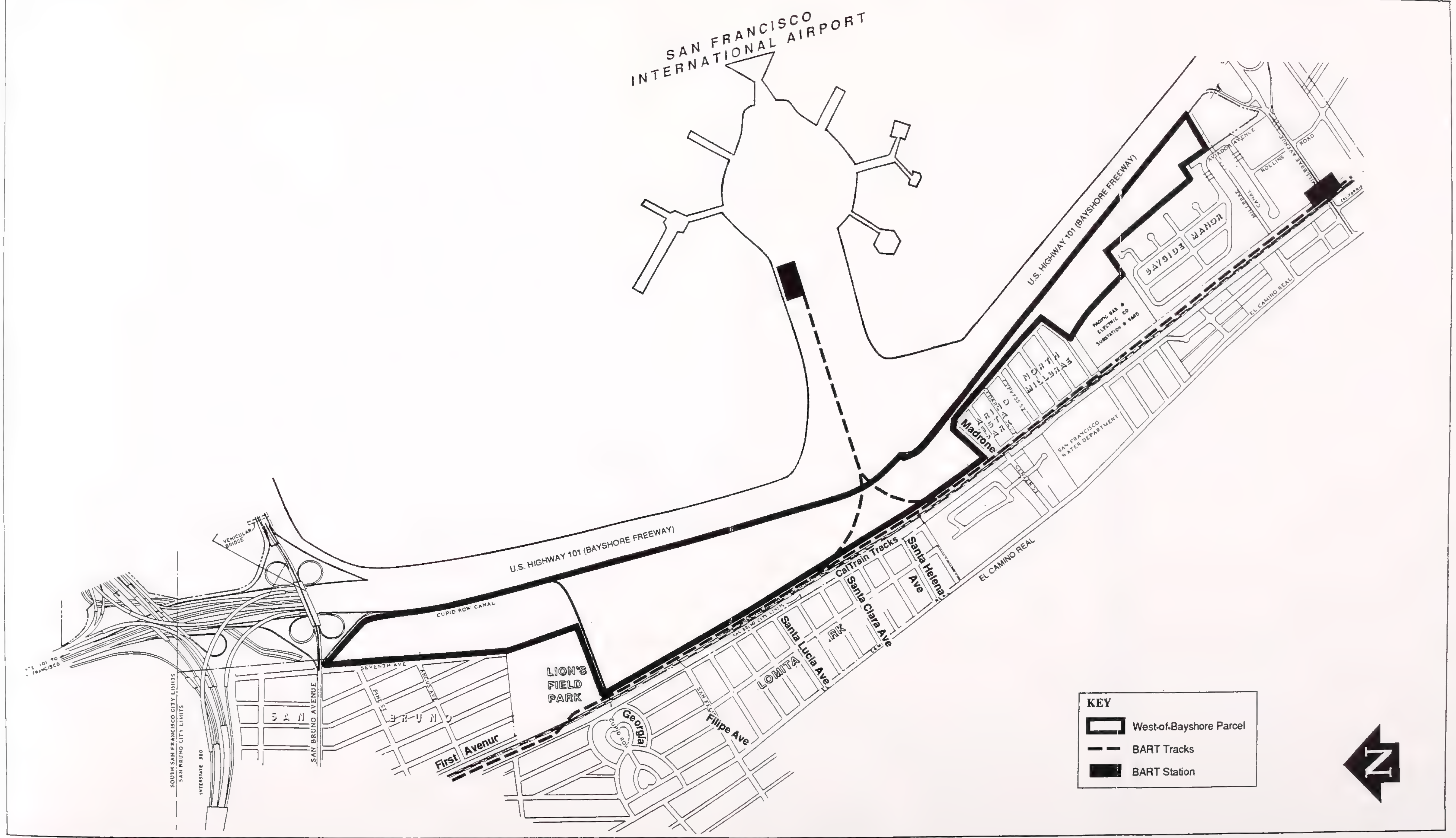
- The USFWS Recovery Plan (1985) for the San Francisco garter snake (SFGS) is intended to reduce the danger of extinction of the remaining populations of the SFGS. The USFWS is currently in the process of revising this plan (personal communication Alison Willy, Biologist, USFWS, 1995).

The reader may refer to these documents for more detailed descriptions of the project alternatives and the newly selected LPA (Alternative VI Aerial Design Option), impacts of the new LPA, and life requirements of the SFGS, California red-legged frog and San Francisco forktail damselfly.

2. PROPOSED ACTION

2.1 Project Description

The aerial wye-stub to the planned SFIA Terminal is a design option of Alternative VI for the BART-San Francisco Airport Extension Project (Figure 2-1). Referred to as the Alternative VI Aerial Design Option and selected as the LPA by the BART and SamTrans Board of Directors, the alignment, stations, and ancillary facilities are identical to those of Alternative VI. These features of



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Alternative VI Aerial Design Option to the Airport International Terminal

FIGURE

2-1

the project were evaluated in the BART–San Francisco Airport Extension DEIR/SDEIS from the end of the Colma tailtrack to Angus Avenue south of downtown San Bruno.

The Aerial Design Option differs from Alternative VI only in the segment between Angus Avenue in San Bruno and the end of the Millbrae Avenue Station tailtracks in Burlingame. Instead of a tunneled subway alignment to the planned Airport International Terminal, as in Alternative VI, this design option provides an east-west aerial wye-stub perpendicular to the CalTrain mainline, terminating at the planned SFIA Terminal that is under construction by the SFIA. The Alternative VI Aerial Design Option would also provide straight-through mainline service along the CalTrain right-of-way to a Millbrae BART/CalTrain Intermodal Station located at Millbrae Avenue.

South of Angus Avenue in San Bruno, the subway alignment would transition from the west to the east side of the CalTrain tracks and continue in subway to Georgia Avenue. Between Georgia Avenue and San Felipe Avenue, the north leg of the wye-stub would split off from the mainline tracks, and the two lines would rise to ground level or at-grade in a retained cut. South of San Felipe Avenue, the mainline would continue south, parallel to the CalTrain tracks to the Millbrae Avenue Station.

The north and south legs of the aerial wye-stub would ascend and curve east on aerial structures over the SFIA west-of-Bayshore property, under the PG&E tower lines, over Highway 101 and the existing elevated highway ramps to the SFIA International Terminal Station.

An auxiliary track would be located at grade, parallel to, and east of the CalTrain tracks between Santa Inez and Santa Clara Avenues in San Bruno. The primary function of the auxiliary track would be to provide train access to the car wash facility. The car wash equipment building would be located east of Santa Clara Avenue along the auxiliary track. The CalTrain right-of-way and the existing dirt road alongside Lion's Field Park that terminates at First Street, would be improved and used to access the car wash facility.

A sound wall would be provided on the western edge of the CalTrain mainline right-of-way, from approximately 400 feet north of San Felipe Avenue in San Bruno, to the subway portal approximately 500 feet north of Center Street in Millbrae.

One span (approximately 1,000 feet) of the existing overhead PG&E power transmission lines west of Highway 101 would be modified and raised over the BART aerial wye-stub structures.

2.2 Construction Scenario

The following information on the construction scenario is summarized from the *Construction Scenario Report,* dated August 1995, the *BART–San Francisco Airport Extension FRDEIR/S#2DEIS* and the *PG&E Feasibility Study to Relocate/Raise the San Mateo-Martin 115 kV Tower Lines,* dated November 1995. This section presents the most current information available regarding construction methods, activities, and duration. Specific construction practices will vary with access to work areas, soil conditions, proximity of adjacent structures, extent of utilities relocation, traffic control requirements, and permissible noise levels (among other requirements).

Preconstruction Activities

Geotechnical Field Investigation. The purpose of the proposed Geotechnical Field Investigation is to obtain information on soils and ground-water levels for the proposed BART/SFIA Extension. BART has held informal consultations with the USFWS on the entire Geotechnical Field Investigation Program and on the immediate vicinity of the west-of-Bayshore parcel. Based upon the recommendations of the USFWS during the informal consultation process, the Field Investigation Program was split into two phases. The initial first phase addressed 24 of the 28 proposed soil boring sites and 13 of the 17 proposed cone penetrometer sites. These 37 test sites were identified as either "no affect" or "not likely to adversely affect" the SFGS during the field review in November. BART has submitted a BA on the first phase of the planned geotechnical field investigations in November 1995 and is awaiting concurrence from USFWS on these determinations so that work may progress in the winter of 1996. The remaining eight test locations (4 soil boring and 4 cone penetrometer sites) were determined "likely to adversely affect" the SFGS during the field review and thus postponed to the second phase of the Field Investigation Program. This BA addresses the effects of the eight test locations of the second phase of the Field Investigation Program.

The proposed second phase of this program includes 4 exploratory soil boring holes (BH) and 4 cone penetrometer (CP) tests. The proposed test locations of this second phase on the west-of-Bayshore site are depicted in Figures A and B in Appendix A, and are designated as CP-13 through and including CP-16 and BH-16, 18, 19, and 20.

The proposed test locations have been selected specifically to avoid all wetlands and sensitive habitats on the west-of-Bayshore site to the maximum extent possible. Access to test sites will be by existing roadways and across upland areas at selected points and shown in Figures A and B in Appendix A. The exploratory soil borings will be eight inches in diameter and 50 to 100 feet deep. Soil samples will be collected for laboratory testing. Temporary PVC casing will be installed in BH-19 to allow monitoring of groundwater levels. Downhole geophysical testing to determine dynamic soil properties for earthquake design will be conducted at BH-20. For these borings, lockable metal covers (Christy Boxes) will be installed over the casing and flush with the ground surface.

The drilling equipment will be mounted on a single-axle, four wheel drive truck with maximum gross vehicle weight of 16,000 pounds (Figure C, Photograph 1 in Appendix A). The drill rig may be accompanied by a small water truck or water trailer. Engine noise for the rig is similar to a small backhoe or tractor. Each boring will require about six hours from start to finish. Soil samples will be taken about every 20 minutes by driving a sample tube into the soil with hammer blows similar to the sound of a sledge hammer striking a metal plate. Jobsite personnel will include a driller, driller's helper, engineer, and biological monitor for a total of four people.

CP test holes will be two inches in diameter and up to 100 feet deep. The test equipment will be mounted on a single-axle, four wheel drive truck with maximum gross vehicle weight of 16,000 pounds (Figure C, Photograph 2 in Appendix A). Engine noise for the rig is similar to a standard small highway truck. Each test will require about one hour from start to finish. There will be no sampling noise with this rig. Jobsite personnel will include an operator, engineer, and a biological monitor for a total of three people.

Both exploration methods are relatively unobtrusive and will cause very little ground disturbance. Excess drill cuttings will be collected and disposed of offsite. Upon completion of testing and monitoring, all holes will be backfilled to the ground surface with a non-toxic polymer grout. All activities will be planned and executed to limit site disturbance to an absolute minimum. There will be no on-site fueling of equipment.

Completion of the field investigations will take no more than 5 working days, barring adverse weather conditions.

PG&E Transmission Lines. If the BART aerial structures were to pass beneath the transmission lines, PG&E would need to raise the transmission lines by erecting five or six new tubular steel poles adjacent to the proposed BART supporting columns of the aerial structures. The poles would be of sufficient height to provide a 34.0 foot clearance from the bottom conductor over the BART tracks at maximum operating temperature, a Public Utilities Commission (PUC) requirement. The new tubular steel poles will be approximately 135 feet in height. It may be possible that only one pole will be required at the most easterly crossing depending on total height requirement and the FAA height limitations. The steel poles would be located in line with the existing tower line and approximately 10 feet away from the proposed BART aerial structure. The existing lattice steel towers, immediately north and south of the BART alignment, would be reinforced with stronger lattice steel structures. All structures involved in construction, including the three existing towers immediately south of the BART alignment would be insulated with composite insulators.

Because the transmission lines are the primary source of electric power to the North Peninsula Area and the City of San Francisco, construction on these lines would allow only one circuit to be taken out of service (clearance) at any given time. This clearance, however, may not be available continuously for an extended period of time. Each pair of towers on each side of the BART alignment carries two circuits. Therefore, in working between the towers one pair of circuits would have to be maintained on a temporary wood pole or shoo-fly line next to, and west of, the existing PG&E right-of-way, along the existing dirt access road. The shoo-fly line may be approximately 4,000 to 10,000 feet in length, depending on the strength of the existing towers, and designed to avoid the placement of any poles within any wetland (see Figure A in Appendix B). Placement of the shoo-fly poles would require a standard PG&E single truck vehicle with an auger drill. The placement and stringing of electrical lines on each pole will take approximately a total of one-half work day (four hours) to complete. Once the poles are up and the lines are strung, PG&E would not have to access these sites for maintenance beyond what they now require for the existing powerlines. The shoo-fly would remain in place until the work on the affected lines is completed.

Installation of the new tubular towers would require the placement of a temporary construction access berm approximately 50 - 75 feet in width within the wetland area between the two aerial wye-stubs (see Figure A in Appendix B). The earthen berm is the only feasible method to build the access road under high voltage powerlines. The exact location of this construction access berm has not been determined and will depend upon the final location of the tubular towers, however, the attached graphic represents the worst case scenario. BART would require that this earthen berm be constructed on top of a matting material to reduce the amount of soil compaction and enhance the recovery of the wetland when the berm and matting are removed after the towers are erected. Construction equipment expected to be required for the erection of the tubular towers would include cranes, cement trucks, manual line trucks, and various supply trucks. The strengthening of the existing lattice towers immediately north and south of the proposed BART aerial wye stubs would require a bucket truck and manual line trucks. The footings for each tubular tower would be approximately 15 feet square or 225 square feet each. All construction access to the site would be via the existing paved and dirt access roads on the west-of-Bayshore parcel south of the construction site. Depending upon when the construction is to occur, it may be necessary to improve and convert the dirt roads to all weather roads to the construction site by adding gravel to the existing roads.

Total construction time is estimated to be 7 months. The construction of the shoo-fly would require 1 month and each of the three tower lines would need approximately 2 months to complete. The tower lines have to be built consecutively.

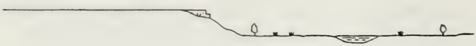
Project Construction Activities

Aerial Wye-Stub. The Alternative VI Aerial Design Option would run east across the west-of-Bayshore parcel in an aerial configuration. The first step in the construction of the BART aerial structure (referred to as the aerial wye-stub) would be the clearing of all woody vegetation from a 70- to 100-foot-wide construction corridor along the alignment on the west-of-Bayshore parcel. The vegetation clearing would start at the westerly end of the north and south wye-stub legs. All tree and brush vegetation removed from the construction corridor would be hauled away by the contractor. Vegetation clearing activities are expected to be completed within a period of approximately three months.

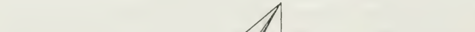
BART would provide access along the construction corridor in support of the building of the aerial wye-stubs on a 40-foot-wide (approximate) temporary trestle bridge. The temporary trestle bridges (one for each wye-stub leg) would be supported on pilings driven into the earth. The bridge platform upon which construction equipment would travel would be elevated above the ground surfaces to allow for free movement of water and wildlife during the time the bridges are in place. A platform would be installed on the pilings for the heavy equipment to travel upon. Figures 2-2 through 2-4 illustrate the sequence of trestle bridge construction. The temporary trestle bridges are expected to be in place for approximately one and a half years (18 months).

The BART aerial wye-stubs and their support columns would be built from the temporary construction trestle bridges. Figures 2-5 through 2-10 illustrate the construction sequence for the aerial wye-stubs. Construction would commence from the westerly end of the alignment, adjacent to the existing CalTrain tracks, and proceed easterly across the west-of-Bayshore parcel. All excavated material would be removed and disposed of off-site. The aerial wye-stubs would be supported by columns, spaced an average of 80 feet apart, with concrete and rebar caisson foundations supporting the columns. Concrete cap footings will be formed and poured on top of the caissons below the existing ground surface. Construction of the caisson foundations is expected to take approximately eight (8) months.

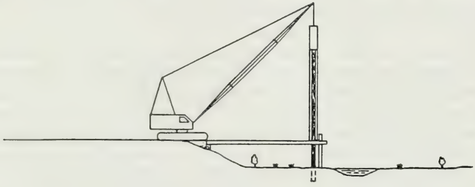
After the construction of foundations and support columns, the aerial superstructure (trackway deck) would be constructed utilizing either prefabricated steel girders, precast concrete box girders using segmental construction, or cast-in-place concrete box girders. All materials as required for the alternative superstructure schemes would be handled by special dollies designed for use on the temporary construction trestle and lifted in place by cranes operating on the construction trestle. For the cast-in-place scheme, the falsework would be supported on the concrete footings only; erection



Step 1: Construct Launching Ramp



Step 2: Place Pile Template



Step 3: Drive Temporary Trestle Support Piles

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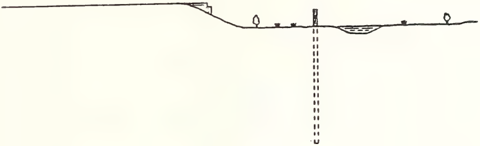
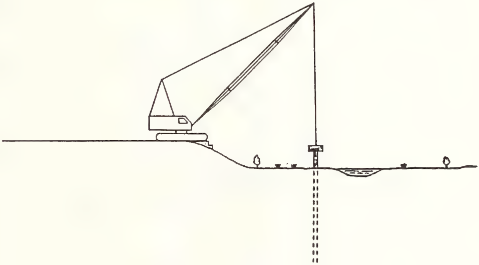
Construction Sequence for Temporary Trestle Bridge Across West-of-Bayshore Parcel

FIGURE

2-2



Step 4: Remove Pile Template



Step 5: Place Temporary Trestle Pile Cap

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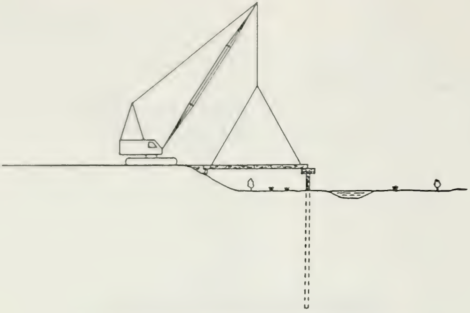
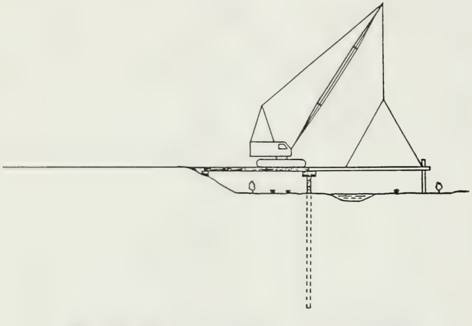
Construction Sequence for Temporary Trestle Bridge
Across West-of-Bayshore Parcel

FIGURE

2-3



Step 6: Place Temporary Trestle Girders



Step 7: Move on to Temporary Trestle Span
and Repeat Steps 2 through 6

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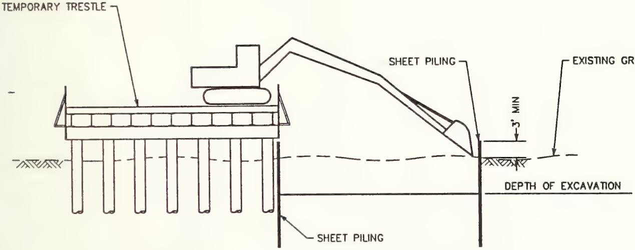
Construction Sequence for Temporary Trestle Bridge
Across West-of-Bayshore Parcel

FIGURE

2-4

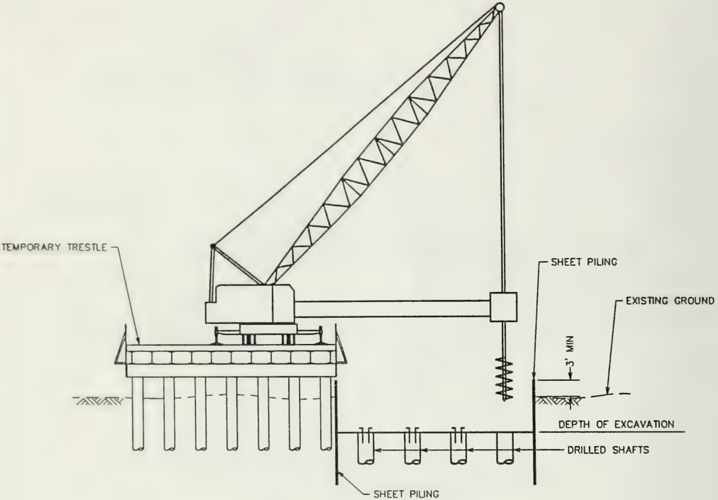


Step 1: Install Sheet Piling and Excavate for Footing

Construction Sequence for Aerial Wye-Stub
Across West-of-Bayshore Parcel

FIGURE

2-5



Step 2: Install Drilled Shafts

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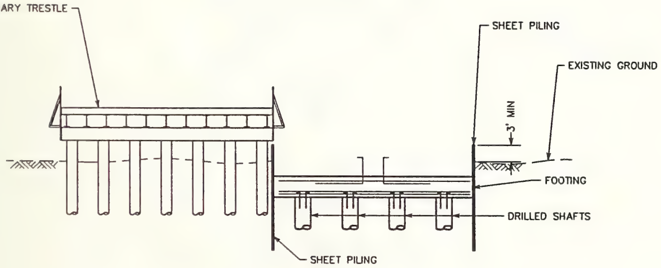
Construction Sequence for Aerial Wye-Stub Across West-of-Bayshore Parcel

FIGURE

2-6

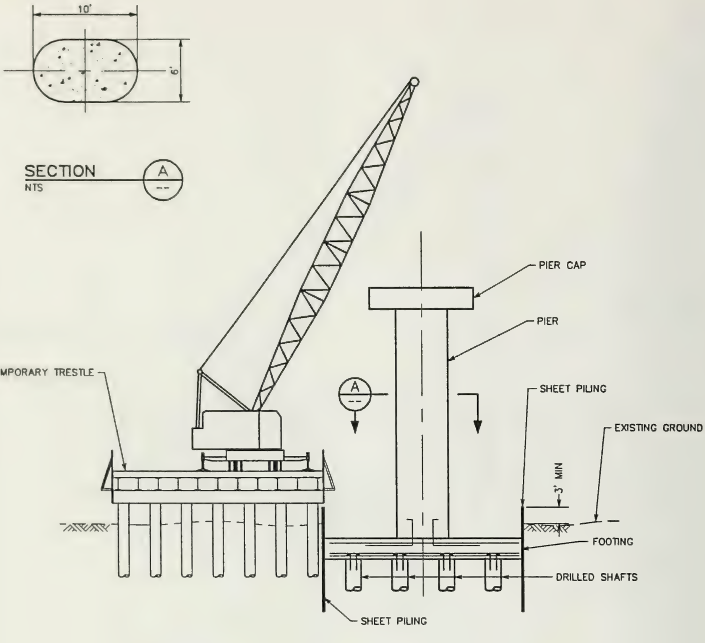


Step 3: Construct Footing

Construction Sequence for Aerial Wye-Stub
Across West-of-Bayshore Parcel

FIGURE

2-7



Step 4: Construct Pier and Structural Steel Pier Cap

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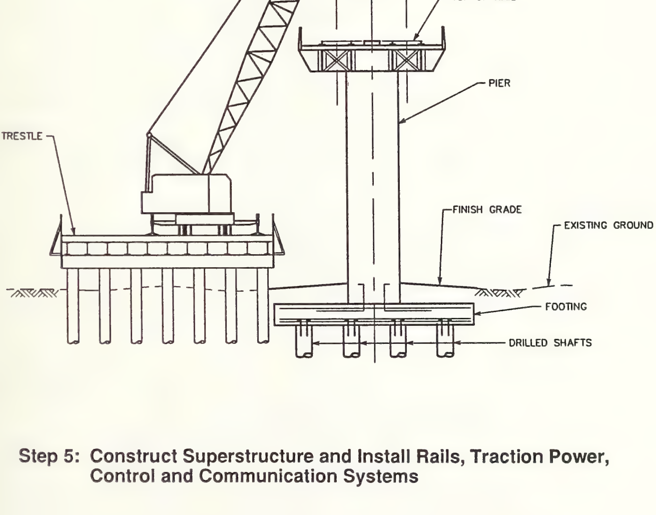
Construction Sequence for Aerial Wye-Stub Across West-of-Bayshore Parcel

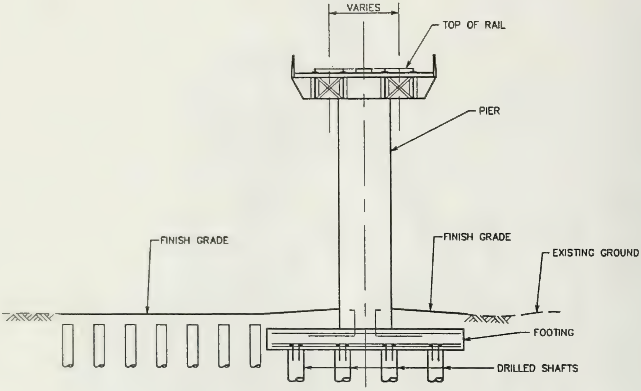
FIGURE 2-8



Step 5: Construct Superstructure and Install Rails, Traction Power, Control and Communication Systems

Construction Sequence for Aerial Wye-Stub Across West-of-Bayshore Parcel

FIGURE 2-9



Step 6: Remove Trestle and Restore Site

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Construction Sequence for Aerial Wye-Stub Across West-of-Bayshore Parcel

FIGURE 2-10

and removal of falsework would be accomplished from the construction trestle. Native soil will be backfilled over the footings after the superstructure is in place.

The construction trestles would remain in place 18 months during construction but would be removed prior to system installations and testing. After the BART aerial wye-stubs have been erected, all vegetation would be allowed to reestablish within the corridor with the exception of large trees adjacent and underneath the aerial structures.

At-Grade Line Sections. Typical activities for at-grade construction include track bed preparation, consisting of tree and shrub removal, clearing and grubbing, relocation of existing utilities, excavation and grading for foundations, placement and compaction of fill material, and placement of sub-ballast, ballast, trackwork, and power and control equipment. Generally, at-grade line construction can be expected to progress 500 feet per week and would be supported from a temporary construction road along the easterly side of the new BART tracks. Based on the preliminary schedule for completion of Segment 2, the estimated time of construction for the at-grade mainline section is approximately 7 months.

Retained Fill Sections. Retained fill sections are similar to at-grade sections except that small to medium height reinforced concrete walls are used to "retain" the fill material used to elevate the tracks higher than the existing grade. After clearing and grubbing and utility relocation, the reinforced concrete retaining walls would be constructed, followed by the importing and compacting engineered fill material to bring the level up to subgrade height. From this point on, the remainder of construction activity, sub-ballast, ballast, trackwork, etc., is the same as for at-grade construction.

Cut-and-Cover Subway Section. A typical cut-and-cover box section will be 10 feet below surface, in order to accommodate underground utilities and landscaping. Cut-and-cover construction is planned to occur at the north and south ends of the mainline alignment next to the west-of-Bayshore parcel. At the northern end this construction technique will extend from Angus Avenue to approximately 500 feet South of Cupid Row Canal. The southern end of the cut-and-cover construction will extend south from a point approximately 300 feet north of Madrone Street.

Following shoring and excavation operations, the line section subgrade would be compacted and graded, and underground subdrains installed as necessary. This process would be followed by placing concrete for the bottom slab foundation. Frequent concrete pours (every two to five days) of 60 to 600 cubic yards or more (six to 60 ready-mix truck loads) can be expected as work proceeds.

The shoring system may be able to serve as the outside form for the concrete box. Panels would be nailed to the shoring system if required to waterproof the walls. Rebars would be placed, collapsible formwork installed, and concrete poured for the sides and roof of the box. Waterproofing may be provided over the roof of the subway structure and a concrete mix poured on top to protect the waterproofing during backfill. The roof and sides of the box would cure for approximately three to seven days (concrete must reach 70 percent of design strength) before the traveling forms are collapsed and moved ahead to the next sections. The box can be backfilled after the section has reached 90 percent of full 28 day design strength. The construction rate for shallow cut-and-cover subway section is approximately 100 feet per week. Based on the rate of construction progress, the estimated time of construction for the cut-and-cover sections is approximately 18 months.

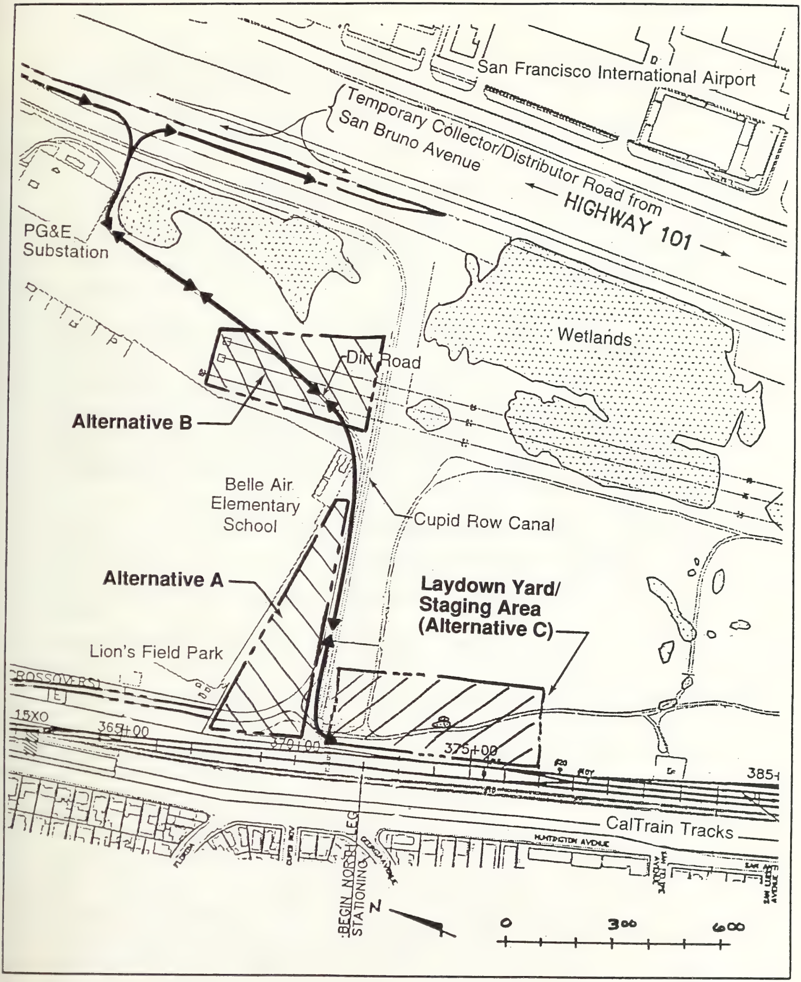
Retained-Cut or Transition Sections. The retained-cut, or sections of the alignment that transition between cut-and-cover subway and at-grade track alignments, are planned to occur at two points along the alignment next to the west-of-Bayshore parcel. The northern section will extend south from the end of the cut-and-cover section approximately 600 feet to a point between San Felipe and San Luis Avenues. The southern section will extend south from a point approximately 500 feet north of the southern cut-and-cover section described above. It is expected that nearly all proposed retained-cut line sections would be U-shaped concrete structures placed an average 20 feet below ground. Construction of this type of structure is similar to that of subway lines, except there is no top slab. For shallow depths, open cut instead of shoring would be utilized. In deeper depths, temporary shoring walls constructed of sheet piling or soldier beams and lagging would be employed. Generally, retained-cut sections require more utility relocation work than cut-and-cover sections, because utilities can not be suspended above the retained cut as they can be suspended above the cut-and-cover box during construction. Utilities (such as sewer lines) spanning retained-cut segments would have to be rebuilt or relocated in most cases. Because of the need to relocate utility lines in these retained-cut sections, the construction period is expected to last approximately seven months.

Storage Yards and Staging Areas. As shown in Figure 2-11, BART has considered three alternative locations for a temporary storage yard and staging area to support construction of the BART mainline from Angus Avenue to just north of Center Street, and the aerial wye stubs between the mainline and the west side of Highway 101. After considering the three alternative locations, BART has selected Alternative Site C for the following reasons:

- Alternative Site C avoids the need to displace the San Bruno Community Garden during the construction period which would be necessary if Alternative Site A were selected.
- Alternative Site C avoids the dangers of working under, or in close proximity to, the PG&E high voltage transmission lines, using cranes or hoists for lifting or moving various equipment and materials as would be the case if Alternative B was selected.
- Alternative Site C is closer to the construction sites and thus requires a shorter access route to construction sites and less travel time for transport of equipment and materials.

Alternative Site C does represent the worst-case scenario in terms of habitat disturbance when compared to the other two alternatives sites because in addition to disturbing the wetlands on the access route it would disturb an additional small amount of wetland habitat within the proposed site.

Alternative Site C is approximately 3.0 acres in area and would be located in the undeveloped upland area west of Highway 101, just south of the Cupid Row Canal and just east of the existing CalTrain tracks and proposed BART mainline alignment. Access to this yard and staging area would be via a new, temporary road running east from the site along the south side of the Community Gardens. The access road would then continue north along an existing dirt road through a section of the west-of-Bayshore parcel toward the existing PG&E substation. Turning east, the road would then connect to an existing Caltrans collector-distributor road along the westerly side of Highway 101 which is tied to the San Bruno Avenue Interchange. Caltrans will have to approve this connection to the San Bruno collector/distributor road. The existing collector-distributor road has enough area along the west side to allow for the construction of temporary deceleration and acceleration lanes required for supply trucks and safe merging with other Highway 101 traffic.


San Francisco International Airport
Temporary Collector/Distributor Road from San Bruno Avenue
HIGHWAY 101
PG&E Substation
Wetlands
Dirt Road
Alternative B
Belle Air Elementary School
Cupid Row Canal
Alternative A
Laydown Yard/ Staging Area (Alternative C)
Lion's Field Park
CROSSOVERS
15XO
365+00
370+00
375+00
385+
CalTrain Tracks
HUNTINGTON AVENUE
BEGIN NORTH LEG STATIONING
N
0
300
600

OGDEN

Temporary Laydown Yard/Staging Area and Access Route

FIGURE

2-11

Construction Truck Traffic Volume. The volume of construction truck traffic was estimated based upon the quantities of required construction materials and other activities contained in Appendix B of the *Construction Scenario Report.* Truck activity includes removal of brush, trees and excess excavated earth; delivery of ready-mix concrete, reinforcing steel, and other construction materials; and delivery of ballast ties, rail and other railway construction materials.

The estimated total volume of truck traffic in and out of this area is approximately 14,400 trips over the 45-month construction period. This volume covers all truck activity to and from the San Bruno temporary storage yard and staging area. The majority of truck traffic will take place over a shorter, 24 month period, when the bulk of the excavation and structural construction will take place. The proposed truck access route to the storage yard and staging area is presented in Figure 2-11.

3. CONSULTATION TO DATE

BART, SamTrans, and the FTA have consulted with the USFWS and the California Department of Fish and Game (CDFG) regularly regarding the possible biological impacts of the proposed project and suitable mitigation measures for these impacts. In addition to phone conversations and meetings that were only indirectly associated with the Section 7 process, the project sponsors have conducted meetings with the USFWS on the following dates in preparation of the DEIR/SDEIS, FRDEIR/S#2DEIS, and Section 7 consultation:

- October 8, 1993 (initial interagency meeting with CDFG);
- January 26, 1994 (second interagency meeting);
- April 25, 1994 (USFWS did not attend third interagency meeting);
- January 3, 1995 (initial meeting USFWS and CDFG on all alternatives including Alternative VI);
- March 2, 1995 (meeting with SFIA and the San Francisco Water Department (SFWD) on possible mitigation options);
- March 16, 1995 (meeting with USFWS on potential mitigation measures);
- July 21, 1995 (informal consultation with CDFG introducing Alternative VI Aerial Design Option);
- July 28, 1995 (FTA Environmental Issues Meeting);
- August 15, 1995 (informal consultation with USFWS only);
- September 21, 1995 (conference call to USFWS);

- November 29,1995(meeting with the San Francisco International Airport planning staff and USFWS);
- November 1995 (submittal of Draft Biological Assessment to the USFWS); and
- January 18, 1996 (conferance call to USFWS)

The submittal of this BA marks the initiation of the formal consultation process under Section 7 of the FESA.

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4. SPECIES INFORMATION

4.1 Existing Plant Communities and Wildlife Habitats in the West-of-Bayshore Parcel

Nearly all of the west-of-Bayshore parcel was at one time part of the San Francisco baylands with salt marshes and sloughs. Between approximately 1939 and 1969 the parcel was cut off from San Francisco Bay by the Bayshore Highway and the SFIA. The parcel was drained and used for agriculture (livestock pastures and hay) until approximately 1969 when many of the sloughs and waterways were filled. The existing drainage and seasonal wetlands on the parcel have been constructed and maintained by human activities.

The vegetation communities and wildlife habitats currently occurring within the west-of-Bayshore parcel include freshwater marsh, non-native grassland, riparian vegetation, ruderal or weedy vegetation, and landscaped vegetation (see Figure 1-2). The most extensive habitats on the west-of-Bayshore parcel consist of wetlands, riparian, and non-native grasslands. The following is a brief description of the vegetation communities and wildlife habitats found within the west-of-Bayshore parcel.

Freshwater Marsh and Seasonal Wetland Vegetation (Wetland). Freshwater marsh vegetation, consisting of cattails, tules, rushes, and sedges occurs along Cupid Row and the South Lomita Canals. These perennially wet habitats support a wide variety of wildlife including the California red-legged frog and the SFGS. Seasonal wetlands occur within the topographic depressions immediately west of Highway 101 within the PG&E transmission line alignment, and in intermittent flowing channels like San Felipe Canal. These habitats are typically dominated by annual herbaceous plant species or may essentially be devoid of vegetation cover like much of the San Felipe Canal.

Riparian Vegetation (Willow Thickets). There are no extensive riparian corridors consisting of vertical tiers of vegetation within the west-of-Bayshore parcel. Riparian vegetation within this parcel of land consists of scattered arroyo willow (*Salix lasiolepis*) thickets along Cupid Row and South Lomita Canals where they are closely associated with the freshwater marsh vegetation.

Non-native Grassland (Uplands). Non-native grassland is one of the most prevalent vegetation communities within the west-of-Bayshore parcel and presently comprises approximately 30 acres of this parcel. This vegetation community is dominated by non-native annual grasses and weedy annual and perennial forbs, with scattered native wildflower species. Typical non-native plant species

detected include brome grass (*Bromus* spp.), wild oat (*Avena fatua*), barley (*Hordeum* spp.), bur-clover (*Medicago hispida*), red-stemmed filaree (*Erodium cicutarium*), shepherds purse (*Capsella bursa-pastoris*), black mustard (*Brassica nigra*), yellow star thistle (*Centaurea solstitialis*), and chickweed (*Stellaria media*). Typical native species detected include Douglas' lupine (*Lupinus nanus*), California poppy (*Eschscholzia californica*), and wild hyacinth (*Dichelostemma pulchellum*). Such species are typical of open grazed lands.

Ruderal (Weedy) Vegetation. Disturbed habitats are characteristically associated with land which is significantly and repeatedly altered by surface disturbances. Such habitat is typically found in vacant lots, roadsides, construction staging areas, or graded lots. The railroad right-of-way itself supports this type of plant community, and it is very common along the project alignment adjacent to the west-of-Bayshore parcel.

Common introduced or non-native plant species include mallow (*Malva* sp.), filaree (*Erodium* spp.), cut-leaf plantain (*Plantago* sp.), cudweed (*Gnaphalium* sp.), horseweed (*Conyza canadensis*), anise (*Daucus carota*), wild oats, brome grass, common thistle (*Cirsium* sp.), yellow star-thistle, mustard (*Brassica* sp.), and wild radish (*Raphanus sativus*).

Landscaped Vegetation. Landscaped vegetation, sometimes referred to as urban mix vegetation, is composed of trees and shrubs that have been planted for landscape purposes and those that have become naturalized, including such non-native tree species as blue gum (*Eucalyptus globulus*) and acacia (*Acacia* spp.). The largest landscaped areas consist of the blue gum groves on the west-of-Bayshore parcel next to the CalTrain tracks although large landscape trees are scattered along much of the urbanized project corridor.

4.2 Listed, Proposed and Candidate Species in the Project Region

In a letter to BART, the USFWS has designated 23 candidate and/or proposed plant species, eight candidate mammal species, three candidate reptile species, three candidate and/or proposed amphibian species, five candidate and/or proposed fish species, eight candidate bird species and nine candidate and/or proposed invertebrate species that are known to occur in the project region (San Mateo County) and could potentially occur in the project corridor. Only one of these species is known to inhabit the portion of the proposed project corridor which runs through the west-of-Bayshore parcel (Figure 1-2); the California red-legged frog *(Rana aurora draytonii)*, which was subsequently advanced to a proposed endangered status (February 2, 1994). The USFWS list also had seven plant, one mammal, one reptile, three fish, seven birds, and four invertebrate endangered or threatened species. The one listed endangered reptile, the San Francisco garter snake *(Thamnophis sirtalis tetrataenia)* is known to occur within the west-of-Bayshore parcel and this population has been monitored in recent surveys (McGinnis, 1992). None of the other listed endangered or threatened species were found in the project corridor.

Additional lists provided by the CDFG and other concerned groups in their comments on the AA/DEIR/DEIS, increased the list of potential sensitive species that are known to occur in the project region. Of these additional sensitive species, the San Francisco forktail damselfly *(Ischnura gemina)* is the only one known to occur in the west-of-Bayshore section of the proposed project corridor.

A series of specific wildlife surveys have been conducted for the proposed project to supplement existing information on sensitive species known to occur on the west-of-Bayshore parcel. During 1990 and 1991, the Pacific Gas & Electric Company and MTC initiated a study of the west-of-Bayshore parcel to determine suitable habitat localities and estimate the SFGS population on the site (McGinnis, 1992). In June 1991, John E. Hafernik, Jr., Ph.D., conducted a specific survey for the San Francisco forktail damselfly at the west-of-Bayshore parcel and north of Madrone Street (Hafernik, 1991).

A second set of specific wildlife surveys were conducted to supplement the data contained in the two surveys noted above. Dr. Hafernik's 1991 survey of the San Francisco forktail damselfly was supplemented by a specific survey of the area immediately south of the original project area. A specific survey for the California red-legged frog on the west-of-Bayshore parcel was performed by Michael S. Marangio in September and October 1993.

A survey was conducted for fairy shrimp in the seasonal wetlands on the west-of-Bayshore parcel and in particular for the California Linderiella *(Linderiella occidentalis)*, which is a proposed endangered species under the FESA (Entomological Consulting Services, Ltd., 1994). Although not listed in any of the correspondence or comments on the AA/DEIR/SDEIS, the project sponsors conducted the survey due to concerns over the status of fairy shrimp and the presence of seasonal wetlands on the west-of-Bayshore parcel. The results of the survey indicated that fairy shrimp do not occur in the seasonal wetlands on the site. For greater detail on the surveys conducted for sensitive species in the project corridor, the reader may refer to the AA/DEIR/DEIS and the DEIR/SDEIS, in particular to the appendices of these reports.

4.3 Sensitive Species Found on the West-of-Bayshore Parcel

A brief discussion of those sensitive species found in the west-of-Bayshore parcel is presented below. A more detailed discussion may be found in the references cited within the text and in the technical appendix of the DEIR/SDEIS.

San Francisco Garter Snake (SFGS)

Status. The SFGS (*Thamnophis sirtalis tetrataenia*) is a federally listed endangered species. It was originally protected by listing in March 1967 (32 Federal Register 4001) and was subsequently afforded additional protection under the FESA of 1973. The SFGS was listed in 1971 as an endangered species under the California Endangered Species Act (CESA). In 1985, the USFWS, in cooperation with the CDFG, published a Recovery Plan for the SFGS. The following summarizes the goals and objectives of this plan to reduce the danger of extinction of the remaining populations of this federal- and state-listed endangered reptile.

- The SFGS will be considered "recovered" when 10 populations are adequately protected and each supports at least 200 adult snakes (50:50 sex ratio) for 15 consecutive years. Under these conditions, this species may be considered for delisting.
- To attain this recovery condition, it will be necessary to secure the six presently known populations, each with at least 200 adult snakes (50:50 sex ratio), protect/establish four

additional populations each with at least 200 adult snakes (50:50 sex ratio), determine population levels and enhance, if necessary, implement site-specific management plans, and undertake law enforcement and public awareness efforts.

- Life history studies and habitat surveys must be completed, and population trends and habitat needs determined; specific habitat areas must be delineated, secured, and habitat management plans developed; local planning agencies must be informed of the management needs of SFGS on a site-by-site basis.

- Management/maintenance needs to ensure that the species remain in a recovered state include the successful implementation of management plans, public awareness programs, law enforcement efforts and integration of recovery plan objectives into local land use planning.

At the present time the USFWS and CDFG has initiated a revised recovery plan effort for the SFGS. The recovery team of experts has been identified and is now meeting to revise the Recovery Plan (personal communication. Alison Willy, Biologist, USFWS March, 1995).

Historic and Current Distribution and Range. Historically, the SFGS has been found on the San Francisco Peninsula from approximately the San Francisco/San Mateo countyline southward to Point Año Nuevo (Barry, 1978). Fox (1951) reported 12 localities, while Barry (1978) reported some 28 localities. Barry also reported that one of localities in the Fox report (the sag ponds along Skyline Boulevard) had been destroyed by urbanization. A subsequent survey by McGinnis between 1984-1987 (1989a) reported 26 localities including one in the extreme northwestern corner of Santa Cruz County. Many of the historical locations of this subspecies have been destroyed by urbanization, especially in the northern and eastern portions of its original range. Most SFGS populations that once occurred along privately owned drainages have been partly or completely extirpated by urbanization, agriculture, highway construction, roadway kills, illegal collecting and other human disturbances. Most of the extant SFGS populations are situated partly or entirely on public lands.

Threats to Populations. Alteration and isolation of habitats resulting from urbanization is the principal reason for decline of the SFGS. This includes loss and adverse modification of wetland and adjacent upland habitat by urban, industrial, and recreational development, as well as agricultural conversion, continued heavy grazing of cattle in feeding ponds and retreat sites, stream and creek channelization, removal of emergent vegetation, and rip-rapping of streambanks and shorelines. Although the geographical range of the SFGS appears to be relatively extensive, recent field surveys suggest it has a very limited and localized occurrence in San Mateo and northern coastal Santa Cruz counties (Barry, 1978, McGinnis 1989a). In addition to human-caused habitat loss and alteration, collection by reptile fanciers and dealers poses a significant threat to the SFGS because of its attractive coloration.

Habitat Requirements. SFGS are observed most often in the vicinity of permanent water bodies such as ponds, lakes, marshes and sloughs (Fox, 1951). However, they also use temporary ponds and other seasonal water bodies. Emergent and bankside vegetation, such as cattails *(Typha* spp.), bulrushes *(Scirpus* spp.), and rushes *(Juncus* spp.) are apparently preferentially used for cover. The interface between aquatic habitats and grasslands with scattered shrubs is used for basking, while nearby dense vegetation or water provide escape cover. Recent field studies using radiotelemetry have shown that the SFGS use rodent burrows some distance away from standing water for shelter and escape, and low-lying marshy areas are used for feeding and reproduction (McGinnis, 1990, 1992). This work has also revealed that both summer and winter subterranean retreat areas or hibernacula may also be located in upland areas previously not believed to be preferred habitat for this species.

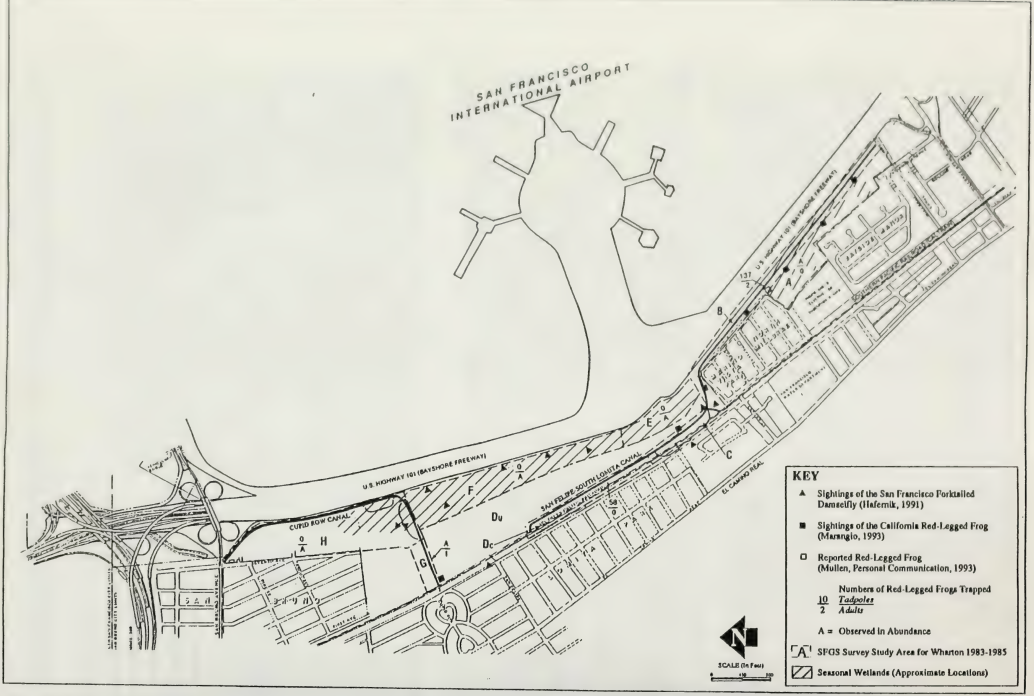
The primary prey item of the SFGS reported by Fox (1951) and Barry (1978) is the California red-legged frog *(Rana aurora draytonii).* However, investigations by CDFG (Drummond, 1983) indicate that the SFGS has a more generalized diet consisting of Pacific tree frogs *(Hyla regilla),* California slender salamanders *(Batrachoseps attenuatus),* recently metamorphosed western toads *(Bufo boreas),* and bullfrogs *(Rana catesbeiana).* The three spine stickleback *(Gasterosteus aculeatus),* and the mosquito fish *(Gambusia afinis)* have also been recorded in their diet (Wharton, et al. 1987; McGinnis and Larsen, 1991). Although the SFGS itself may not be particularly sensitive to water salinity, its primary food source, frogs, are quite sensitive to salinity and do not occur in saline environments (Hydro Science, 1992).

The SFGS typically emerges from hibernation during March, and activity increases throughout the spring, reaching a peak in May. In June, activity drops substantially, then remains relatively stable throughout the summer. In September, activity again drops and remains low throughout the fall. Almost no activity occurs during winter, except for brief periods on sunny days.

Little is known of the seasonal movements of the SFGS. It is presumed that individual SFGS have definite home ranges, determined largely by site conditions (i.e., availability of food, cover, etc.) as discussed by Stickel and Cope (1947). SFGS movements of 900 and 1,225 feet have been recorded in radio telemetric studies conducted at the west-of-Bayshore parcel (McGinnis and Larsen, 1991). In both instances, SFGS remained within an area of less than 100 feet in diameter after their migratory trips. Nearly all of the SFGS activity was centered along the banks of the larger canals on the site. When sojourns were made away from the banks, they were always to retreat sites in upland areas within 40 feet of the upper bank edge.

Reproduction. The reproductive cycle of SFGS was studied by Fox (1952, 1954) and found to be similar to other Pacific coast subspecies of *T. sirtalis* (Stewart, 1968). Mating occurs either in the spring or fall but is especially concentrated in the first few warm days of March. Ovulation in T. *sirtalis* generally occurs in late spring. Gestation takes place in early summer, and birth of young occurs from July to August. Like most garter snakes, *T. sirtalis* is ovoviviparous, producing from three to 85 young, with an average litter size being 12 to 24 (Fitch, 1970).

West-of-Bayshore Population Characteristics. The SFGS inhabits the entire 180 acres of the west-of-Bayshore parcel, and has been found in five general areas, as defined by Wharton (1988), and McGinnis and Larsen (1991), and indicated in Figure 4-1. The SPGS has been found in the seasonal wetlands at the southern end of the parcel (Area A), all along and within the southern portion of South Lomita Canal (Area B), all along and in the San Felipe–South Lomita Canal (Areas Dc and C), within the uplands between San Felipe–South Lomita Canal and the seasonal wetlands next to the Bayshore Freeway (Area Du), within the seasonal wetlands immediately west of the Bayshore Freeway (Areas E and F), in and along Cupid Row Canal (Area G) and south of San Bruno Avenue and north of Cupid Row Canal (Area H).



SAN FRANCISCO INTERNATIONAL AIRPORT
U.S. HIGHWAY 101 (BAYSHORE FREEWAY)
CUPID ROW CANAL
SAN FELIPE-SOUTH LOMITA CANAL
EL CAMINO REAL
A
B
C
Du
Dc
E
F
G
H
137/2
58/0
0/A
A/1
N
SCALE (In Feet)
KEY
▲ Sightings of the San Francisco Forktailed Damselfly (Hafernik, 1991)
■ Sightings of the California Red-Legged Frog (Marangio, 1993)
□ Reported Red-Legged Frog (Mullen, Personal Communication, 1993)
10/2 Numbers of Red-Legged Frogs Trapped Tadpoles/Adults
A = Observed In Abundance
A SFGS Survey Study Area for Wharton 1983-1985
▨ Seasonal Wetlands (Approximate Locations)

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Reported Locations of the SFGS, California Red-Legged Frog, and San Francisco Forktail Damselfly on the West-of-Bayshore Parcel

FIGURE 4-1

The largest numbers of SFGS individuals were reported along, and in South Lomita Canal (Areas A, B and C), where aquatic habitats are available year-round. In the spring months, the seasonal wetlands immediately west of Highway 101 (Areas E and F) are typically full of water and attract the SFGS to these areas to feed. The San Felipe portion of the San Felipe–South Lomita Canal (Area Dc) is used in the spring, when it is full of water, as a travel corridor between Cupid Row Canal and South Lomita Canal. Cupid Row Canal at one time provided good habitat for the SFGS, but had been altered by tidal influences and increased water salinities. More recent efforts to actively manage the tidal gates at the mouth of this canal have improved the habitats for the SFGS and its prey species. Trapping in Areas H and Du have resulted in the capture of only a few SFGS, indicating limited use of these areas.

During surveys conducted between May 1983 and October 1985, 635 SFGS were captured throughout the west-of-Bayshore parcel (Wharton, 1988). Based upon the results of this two-year study, the actual population of SFGS at this site was estimated at between 465 and 526 individuals. This represented the largest population of SFGS identified to date. Subsequent surveys conducted over a two year time span in 1990 and 1991 (McGinnis, 1992), concluded that the number of SFGS trapped in the same study area was significantly lower. These studies show that the numbers of SFGS has declined at this site since 1985 and that the remaining SFGS are concentrated in the area of the South Lomita Canal and the seasonal wetlands immediately west of Highway 101, during spring months in years when these wetlands fill with water.

This reduction in population was due in part to seven consecutive years of drought conditions at the time of the second study. Although one explanation for population reduction may be related to the drought, there are other contributing factors, such as:

- The intrusion of saltwater in Cupid Row Canal, which alters the aquatic habitats and eliminates vegetation cover and food sources for the SFGS in this canal.
- The introduction of non-native predator species (e.g., bullfrog) to the site which may have significantly reduced the principal food source (i.e., California red-legged frog) for the SFGS.
- Continued risks to SFGS include individuals from illegal collectors, and vehicular traffic, despite continued efforts by SFIA to secure the area.
- Ground level entryways to underground culverts in which individual SFGS enter and cannot escape.

If these conditions were to persist on the west-of-Bayshore parcel, the USFWS has expressed concern regarding the welfare of the resident SFGS population (personal communication. Alison Willy, Biologist, USFWS, 1995).

California Red-Legged Frog

Status. The California red-legged frog (*Rana aurora draytonii*) has been proposed for listing as endangered under the FESA (Federal Register, February 2, 1994), and is a California "Species of Special Concern."

Historic and Current Distribution and Range. The California red-legged frog occurs west of the Sierra-Cascade crest and in the Coast Ranges along the entire length of the state. It has apparently been extirpated in the Central Valley of California. A study of known California red-legged frog sites in the Central Valley and foothills found this species to be extinct in over 50% of the Central Valley drainage systems, where it was historically recorded (Hayes and Jennings 1988).

Threats to Populations. Much of the habitat of the California red-legged frog has undergone significant alterations in recent years, leading to extirpation of many populations. Causal factors in the continuing decline of this species is poorly understood. Insufficient understanding of California red-legged frog habitat requirements has been the main problem in identifying their decline (Hayes and Jennings 1986). Factors that have been proposed as contributing to its decline include its former exploitation as food (Jennings and Hayes 1985), predation or competition by the introduced bullfrog *(Rana catesbeiana),* fish predation (Moyle 1973), and habitat modification (Hayes and Jennings 1986, 1988). California red-legged frogs and bullfrogs occasionally occupy the same aquatic habitat in coastal areas, but are not known from the same locale in the Sierra Nevada Mountains and foothills (personal communication. Mark Jennings, 1992).

Habitat Requirements. The California red-legged frog inhabits quiet pools in marshes and streams and in ponds. It is closely tied to its aquatic environment, and is generally associated with permanent and intermittent streams. Shrubby willows are often found at sites where the California red-legged frog are found. They are generally found on streams having a small drainage area and low gradient (Hayes and Jennings 1988). Adults feed on aquatic and terrestrial insects, crustaceans, snails, worms, small fish, and tadpoles, as well as smaller frogs.

Reproduction. This species' reproductive season spans January to March (Stebbins 1962). Females deposit 2000 to 4000 eggs in permanent or nearly permanent pools.

West-of-Bayshore Population Characteristics. Based on past, and more recent field surveys on the west-of-Bayshore parcel, it appears that population levels and suitable habitats for the California red-legged frog are declining. Surveys in 1984 and 1985 for the SFGS (Wharton 1988), noted that California red-legged frog tadpoles and adults were "in abundance" in the wetland areas associated with and in Cupid Row Canal. In a 1993 survey (Marangio, 1993), only two adult California red-legged frogs were found in a short reach at the western end of Cupid Row Canal and the remaining aquatic habitat was not suitable due to increased salinity levels. California red-legged frogs were also found in this study along the entire length of South Lomita Canal (see Figure 4-1). In addition to the California red-legged frog, the 1993 survey revealed an abundance of bullfrogs throughout the aquatic habitats of the west-of-Bayshore parcel. There was no historic information available on the abundance of bullfrogs on this site prior to this survey.

San Francisco Forktail Damselfly

The San Francisco forktail damselfly (*Ischnura gemina*) is a candidate for listing as endangered or threatened under the FESA. This species is associated with seepages, ponds, and slow-moving streams or canals. A survey, conducted in September and October 1993 on the west-of-Bayshore parcel, between the North Millbrae community and the Millbrae Canal to the south concluded that current conditions do not appear adequate to support a breeding population (Hafernik, 1993b). This survey did reconfirm an earlier survey (Hafernik, 1993a) indicating that active, adult breeding populations of the San Francisco forktail damselfly still exist in the seasonal wetlands just west of the Bayshore Freeway and in northern portions of the South Lomita Canal (see Figure 4-1). The best breeding habitat for this insect is in the large seasonal wetland at the northern end of Area F, since this large seasonal wetland retains water longer than any other wetland in the west-of-Bayshore parcel.

5. EFFECTS OF THE PROPOSED ACTION

Populations of all three of the sensitive wildlife species known to occur on the west-of-Bayshore parcel (the SFGS, the California red-legged frog and the San Francisco forktail damselfly) are likely to be adversely affected as a result of the proposed action. The red-legged frog and the damselfly may be adversely affected by the displacement of wetland habitats, and the SFGS may be adversely affected by the displacement to wetland and upland habitats by project features (permanent or long-term impacts). These same species may be adversely affected by temporary or short-term impacts associated with project construction activities. The proposed action may contribute to effects caused by other future state, local or private actions that are reasonably certain to occur on the west-of-Bayshore parcel (cumulative effects). The following subsections define those permanent, temporary and cumulative effects that the proposed action may have upon the SFGS, California red-legged frog, and San Francisco forktail damselfly populations.

5.1 Permanent & Temporary Effects

Permanent Effects

Permanent effects are defined as those actions that permanently remove or destroy habitats, the SFGS, California red-legged frog and/or San Francisco forktail damselfly occupy, due to the design and siting of project facilities. For example, surface or at-grade and retained cut alignments would result in a permanent loss of those biotic resources (habitats) that exist within the areas where these facilities would be placed. The mainline alignment of the Aerial Design Option would eliminate approximately 9.87 acres (or approximately 6% of the 180 acre west-of-Bayshore parcel) of wetland and upland hibernacula used by the endangered SFGS. Of this 9.87 acres, approximately 0.85 acres are wetlands, also known to support the California red-legged frog and San Francisco forktail damselfly.

The aerial wye-stub column footings would eliminate approximately 0.59 acres (or approximately less than 0.5% of the entire 180 acre west-of-Bayshore parcel) of upland and wetlands on the west-of-Bayshore parcel that support the endangered SFGS. Of this 0.59 acres, approximately 0.04 acres would be wetlands also known to support the California red-legged frog and the San Francisco forktail damselfly.

Maintenance and operations of the BART facilities on the west-of-Bayshore parcel are not expected to permanently effect the populations of the three sensitive species known to occur at this site. The aerial configuration of the wye-stub structure will allow the SFGS on the site to move freely between habitats north and south. Maintenance of the BART/facilities would not require the building of a maintenance road on the west-of-Bayshore parcel. All maintenance activities on these structures would be accomplished from specialized vehicles that would operate on the BART tracks. The mainline alignment will be adjacent to the existing CalTrain tracks and is not expected to present a new significant barrier to existing dispersal corridors on the west-of-Bayshore parcel.

Temporary Effects

Temporary effects are defined as those actions that would effect the habitat quality of the SFGS, California red-legged frog and/or San Francisco forktail damselfly due to actions related to the construction of Alternative VI Aerial Design Option on, or in the immediate vicinity, of the west-of-Bayshore parcel. These types of effects would occur due to increased noise and vibration, blockage of dispersal corridors, and increased risks of predation or injury due to operations of heavy equipment and vehicles in the construction areas. Particular temporary effects associated with the construction phase of the project are identified and discussed below. Noise, vibration, and human activities above the normal ambient levels for a given site may possibly harass individual SFGS. It should be noted, however, that habitat areas are affected by highway and aircraft noise currently, and construction noise may be approximately the same over the entire 180 acre site. The anticipated elevated noise levels at specific localities on the west-of-Bayshore parcel during construction activities could disrupt the SFGS use of local areas for breeding, rearing, foraging, feeding and shelter.

All proposed construction sites on, and in the immediate vicinity of, the west-of-Bayshore parcel would pose a local threat, and may result in the loss of individual SFGS, California red-legged frogs and/or San Francisco forktail damselflies. It is not possible to accurately estimate the number of individual snakes, frogs and/or damselflies that would be lost as a result of the proposed construction activities, due to the lack of more recent information on the populations of these species at this site, their general dispersion over the entire site, and the preliminary design of the project. However, potential impacts to these sensitive species, in particular the SFGS, include the loss of protective cover and thus, increased potential for mortality due to predation, and mortality or injury to individuals within construction sites or roadways. Excavations, the placement of fill material, and vegetation clearing activities may result in the reduction of food sources, and hibernation areas during the construction period. These actions may interrupt or alter the species behavior patterns or use of particular feeding, breeding or cover habitats to the extent that they cannot survive.

Construction sites may temporarily block dispersal corridors used by the SFGS, although the construction trestle would reduce this possibility. Typical at-grade construction practices of the aerial wye-stubs could block the north-south movements of some individual SFGS on the west-of-Bayshore parcel. This could result in the isolation of some SFGS in the northern half of the parcel where in normal to dry years, there is no permanent water or food source. The SFGS isolated in this area of the site may starve to death or seek other food sources and be exposed to greater risks of predation or injury. It is for these reasons that BART has proposed the use of the temporary construction trestle to minimize this potential impact.

While all of the construction sites on the west-of-Bayshore parcel are sensitive, certain areas are of particular concern in regards to potential impacts to the SFGS, California red-legged frog and San Francisco forktail damselfly. These areas include Cupid Row Canal and areas in the immediate vicinity of this canal, those portions of the mainline that run next to South Lomita Canal, the north-south movement corridors of the SFGS, and the seasonal wetlands. Specific impacts associated with each of these sensitive areas on the west-of-Bayshore parcel are discussed below.

Cupid Row Canal and Immediate Vicinity. The proposed BART mainline tracks would cross the western end of Cupid Row Canal. The preferred storage yard and staging area site is also located in this area of the west-of-Bayshore parcel, and the temporary access road from the storage yard and staging area could cross over the canal. Although the habitat quality for the SFGS and California red-legged frog has not been good in this Canal in the recent past, it is improving due to better management of the gates, and now has some habitat quality for the endangered species. Although the areas of potential direct impact to the wetland habitats due to these activities is rather limited, the noise and activities associated with these construction sites could possibly disrupt the breeding and/or feeding activities of the SFGS along Cupid Row Canal.

South Lomita Canal and Immediate Vicinity. The Alternative VI Aerial Design Option LPA has been designed to avoid the wetland habitats associated with South Lomita Canal to the greatest extent possible. However, construction of the mainline tracks in this area would require the removal and loss of a limited amount of wetlands associated with the tributary channel near Madrone Street. A portion of the cover habitat (or hibernacula) used by the SFGS in the blackberry thicket, between the canal and the CalTrain tracks, would also be lost. The loss of these habitats pose a significant threat to the SFGS population on the west-of-Bayshore parcel.

Seasonal Wetlands and Upland Habitats Between Highway 101 and CalTrain. Construction of the aerial wye-stubs have been designed to minimize impacts to the upland and wetland habitats on the west-of-Bayshore parcel through the use of a temporary construction trestle. However, unavoidable impacts to the ground surface associated with the aerial wye-stubs and the PG&E relocation of transmission lines would occur. The greatest threat to the SFGS, as a result of the construction activities in the area of the west-of-Bayshore parcel, would be the potential disruption of SFGS use of the seasonal wetlands as a north and south travel corridor. Potential disruptions to SFGS use of these wetlands as feeding and breeding sites would also occur.

5.2 Cumulative Effects

The west-of-Bayshore parcel is owned by the SFIA. Although the San Francisco City and County did not identify any specific development plans for this undeveloped parcel of land in its Airport Master Plan (1989), it did indicate that an intermodal transportation station or center could be located on this parcel at some point in the future. Other potential projects on the west-of-Bayshore parcel would include a gas pipeline extension through a portion of the site (Mojave Pipeline Project), and a PG&E powerline extension project to the Airport. The City of Millbrae has just completed an emergency repair project of its sewer line through the west-of-Bayshore parcel. The Millbrae sewer line project and Mojave Pipeline project have completed their Section 7 consultations. PG&E is now in informal consultation with the USFWS regarding the powerline extension to the airport. Therefore, the BART project would contribute to the direct loss of habitats and associated cumulative impacts of these other projects proposed on the west-of-Bayshore parcel.

At the present time, impacts to the SFGS and California red-legged frog populations are occurring as a result of unauthorized activities as well as site maintenance practices. Vehicle traffic is common on the west-of-Bayshore parcel in support of various maintenance activities including mosquito abatement, flood control maintenance of Cupid Row and South Lomita Canals, fire and security control and maintenance activities associated with the PG&E powerlines and natural gas facilities. Unauthorized activities observed on the parcel include trespassing by vehicles, recreationists, and reported poaching of individual SFGS. All these activities combine to threaten the SFGS and California red-legged frog populations on the site by either injuring or killing individual snakes and frogs (e.g., snakes may potentially be run-over by vehicles), by removing or altering their habitats (e.g., clearing of vegetation in the canals for flood control), or by capture and removal by poachers. The addition of BART operating tracks with security fencing will greatly reduce unauthorized activities at the site. BART prevents intruders into its operating envelope to protect them from the electrified third rail. Therefore, the BART project is not expected to significantly contribute to the cumulative indirect impacts on the west-of-Bayshore parcel, and may improve or reduce the indirect impacts that are currently occurring on the west-of-Bayshore parcel.

6. CONSERVATION MEASURES

The USFWS considers any impact, no matter how limited, to the SFGS population on the west-of-Bayshore parcel to be significant because recent studies have indicated a significant decline in this population, as well as the other known populations, throughout the species range. Consequently, the USFWS considers any disruption to the life requirements of the SFGS in the west-of-Bayshore parcel site significant and could result in the extirpation of this population (personal communication. Alison Willy, Wildlife Biologist, USFWS 1995). As noted above, the placement of BART facilities and associated construction activities on the west-of-Bayshore parcel could have adverse permanent and temporary impacts on the SFGS, California red-legged frog and/or the San Francisco forktail damselfly. To minimize these possible effects and assure the conservation of the species, BART is proposing the following measures to protect the species during and after construction, and to enhance habitat values for the SFGS and California red-legged frog. It is assumed that those mitigation measures that are designed to ehnance wetland habitats for the SFGS and California red-legged frog may also benefit the San Francisco forktail damselfly. However, it should be noted that the emphasis of the conservation measures are upon the two most sensitive species, the SFGS and the California red-legged frog. In addition, BART will comply with the mitigation measures identified in the Phase I Geotechnical Field Investigation Program Biological Assessment and USFWS opinion, which to date has not been provided by the USFWS, (BART, November 1995) for the Phase II effort identified in this BA.

The following discussion first identifies those mitigation measures designed to minimize and avoid the direct and indirect adverse effects that could be caused by project construction (Section 6.1). It then identifies those conservation measures BART proposes to assure the continued existence and viability of the SFGS and California red-legged frog populations either on-site or off-site (Section 6.2).

6.1 Mitigation Measures During Construction

These measures are designed to prevent the movement of SFGS into construction areas and to minimize the risk of snakes being injured or killed by heavy equipment during the preconstruction and 20- to 24- month construction period on, and in, the immediate vicinity of the west-of-Bayshore parcel.

Snake Proof (Exclusion) Fencing of Preconstruction and Construction Areas

BART proposes to clear SFGS from all preconstruction and construction sites in the following manner, or as modified by the USFWS. An exclusion fence will be constructed in accordance with similar exclusion/capture projects conducted elsewhere for wildlife research. The exclusion fence will consist of cyclone or plastic mesh fencing material with a two foot tall drift fence of plywood or aluminum at the base, which will be buried at least 3 inches to prevent any SFGS from crawling under the fencing. Exit funnels will be placed every 50 feet along the fenceline to provide exit points for those SFGS attempting to leave the enclosed construction site. The exit funnels will be constructed in accordance to a USFWS-provided prototype. Preconstruction or construction sites will be fenced for at least a six week period between March and the first of October, when the SFGS are most active, before being considered "cleared of SFGS." If delays or unanticipated circumstances cause a construction site to be cleared of SFGS after September 1st, the site will not only be fenced, but also watered with a sprinkling system, for a total of 2 to 3 inches, for one evening without surface ponding. After waiting a week a second watering would occur with 1 to 2 inches for one evening over the entire site, also with no surface ponding. The purpose of this watering is to saturate the soils and attract the snakes to the surface where they can exit the construction area.

Once a site has been fenced and "cleared," the fencing will remain in place throughout the construction period (except in the case of the temporary construction trestle) to serve as an exclusion barrier and prevent any SFGS re-entering the construction zone. Should a break in the fencing occur between March and October or during a warm spell at other times of the year, the breech in the fence would be repaired immediately by the construction contractor. In addition, the construction site will be surveyed by a monitoring biologist. The monitoring biologist would remove all SFGS found in the construction area and construction activities would then be allowed to proceed. If a wetland occurs within the construction area in which the breech in the fence occurs, then all construction activities in this area would be suspended, and the wetland would then be trapped for a 2-week period to remove any SFGS that may have been attracted to the area.

Preconstruction Activities. The relocation/modifications of the PG&E 115kV transmission towers and lines, and geotechnical investigations will be initiated and completed before BART begins any construction of the temporary construction trestle through the same area. Depending upon final scheduling, the PG&E work on the transmission lines may be completed prior to any construction of BART facilities in the west-of-Bayshore parcel area. Completion of the relocation/modifications of the PG&E 115kV transmission towers and lines is expected to take seven months. All construction sites associated with preconstruction activity will be fenced and cleared of SFGS as described above.

Project Construction Activities. There are four principal construction periods planned for the construction of the BART facilities, with specific construction activities in specific areas or sites, in the vicinity of the west-of-Bayshore parcel.

- The first construction period extends for the first four months and would include the following activities and sites:

  - Site preparation of construction laydown area;
  - Clear and grub vegetation along all track alignments; and
  - Construct temporary trestle across west-of-Bayshore parcel.

- The second period of construction would extend from about the fourth or seventh month until about the 13th or 14th month after construction is initiated and would include the following activities and sites:
  - Excavation of the cut-and-cover sections of the mainline;
  - Construction of subway box structure; and
  - Excavation and construction of aerial pier structures of the north and south aerial wye-stubs.

- The third construction period would begin about 13 months after construction has been initiated and extend to approximately month 19. During this period, the at-grade transition portion of the alignment would be constructed.

- The fourth construction period would extend from approximately month 16 to month 24 and would be the time period that the mainline at-grade section would be constructed.

The following is a description of how the snake proof fencing would be accomplished for each construction period identified above.

The first construction activity period (approximately 4 months) would consist of the clearing and grubbing of woody vegetation along the mainline alignment, aerial wye-stub alignments, and the staging and laydown area. Other construction activities anticipated in this first four months are the development of the temporary construction road along the mainline alignment, the temporary access road to the staging area, and the relocation of utility lines within the CalTrain right-of-way. Exclusion fencing would be placed and maintained around each of these construction sites. The exclusion fencing for the mainline alignment between Center Road and just north of Cupid Row Canal, and the storage yard and its access route to Highway 101 would have to be maintained throughout the entire 20- to 24-month construction period, since some form of construction activity is planned for these sites throughout the two-year construction period.

There are three areas along the mainline alignment of special concern that will have to be handled in a particular manner during clearing and grubbing and temporary access road construction. These areas of special concern include the two seasonal wetlands extending between San Felipe Canal and the CalTrain tracks, and the blackberry thicket between South Lomita Canal and the CalTrain tracks. The proposed project would require that a portion of the two seasonal wetlands along San Felipe Canal be filled for the placement of the section of at-grade BART tracks. The area of required fill in these wetlands would be completed during construction of the temporary access road along the mainline. This would be done so that there are no wetlands behind the exclusion fencing that may become an attractant for the SFGS, should a breech in the fencing occur during the two-year construction period.

The vegetation clearing and grubbing of the blackberry thickets between the South Lomita Canal and the CalTrain tracks will require careful planning and implementation. The exclusion fencing will be put into place prior to any SFGS coming out of hibernation. The clearing of the blackberry and other brush in this area will be done by hand-held, motorized equipment. No heavy, mechanized equipment will be allowed in this area until all the vegetation has been cleared.

Construction of the temporary trestle bridge across the west-of-Bayshore parcel would also occur at this time. Although the cut-and-cover portion of the mainline can be cleared of SFGS and fenced throughout the construction period, this would not be possible for the construction of the temporary trestle bridge, which would span the west-of-Bayshore parcel. The fencing of this entire temporary roadway alignment would span the west-of-Bayshore parcel and cut off the north-south travel route of the SFGS during the six week period the alignment is cleared of snakes, and throughout the month that the temporary trestle is constructed. To minimize the blocking of this important travel route, the fencing and construction of the temporary trestle will have to consider keeping the north-south travel corridor open for the SFGS, during periods of the year the SFGS is most active. For example, the fencing for the temporary trestle alignment could be in place during periods of low activity in the fall, and remain in place through the construction of the temporary trestle in the winter, when SFGS activity and movements are even lower. This would result in the blocking of the north-south travel corridor for only six weeks at a time, when SFGS movements are limited. The construction of the temporary trestle could occur at a time when SFGS movements are further reduced.

However, should it be necessary to clear the trestle alignment in the spring, then BART will split the construction corridor of the aerial wye-stub alignments into a western half and eastern half. The western half of the temporary construction trestle bridge for each aerial wye-stub would be built and completed before the eastern half of the alignments would be fenced for clearing. This will prevent, or at least minimize, the blockage of this major travel corridor of the SFGS, due to the construction of the temporary trestle.

Once the construction of the temporary trestle is completed, the construction of the aerial wye-stub structures may proceed across the west-of-Bayshore parcel during the second construction period. The only SFGS clearance required would be at those points where excavation of the pier structures would take place. Clearance of these sites would involve simply erecting a fence around each footing site prior to removing the fence around the proposed alignment.

The third and fourth construction periods would begin some 8 to 12 months after having been cleared of any SFGS. The at-grade transition segment of the mainline would take approximately 8 months to complete. Construction of the at-grade mainline section between the transition sections and the two retained cut sections of the mainline would take at least a year (12 months) after the construction corridor for these segments had been cleared of SFGS and fenced. Construction of the BART facilities in these sections of the mainline alignment are expected to take between four and six months.

Monitoring During Construction

BART proposes that a biological monitor or monitors be present during project construction to assure that the mitigation measures defined above are in place and effective. A biological monitor(s) will help minimize the direct loss of SFGS, the harming of SFGS, and prevent accidental disturbances of habitats. The on-site biologist(s) will also be able to address unexpected issues.

A biological monitor will be present to check the construction sites daily for SFGS, when the snakes are the most active (March to May), and periodically during the remainder of the year. This monitoring biologist will educate construction crews on the sensitivity and identification of the SFGS and penalties for taking or handling the snake. Members of the construction crews will be given "flash cards" upon which pictures of the SFGS and California red-legged frog are printed with a brief description of each species. In addition, larger poster-sized pictures and descriptions of these species will be displayed at prominent locations in the contractors storage yard on-site. In the event a SFGS is found in the construction area, the monitoring biologist will be notified immediately and all construction activity in that area will immediately cease. The monitoring biologist will immediately notify the USFWS and CDFG and remove the SFGS as approved by these agencies.

A Biological Monitoring Plan will be developed and approved by the USFWS, CDFG, BART, and the construction contractor(s). Elements of this plan will include the following:

- Identification of the responsibilities of all involved in the field investigation and monitoring effort. This will include a description of assignments, responsibilities, and reporting procedures in the event of a significant problem or potential problem (such as a SFGS is found at a construction site, is injured, or killed). The monitoring biologist will have the authority to stop all or any part of the work, should they observe construction practices that do not comply with the endangered species permit issued by the USFWS.

- Definitions of acceptable operating procedures to minimize disturbances include, access and travel on the west-of-Bayshore parcel, disposal of waste, handling of fuels and water, operational procedures designed to minimize ground disturbances, operational safety features, and site security. Specific operating procedures may include the following:

    - All vehicle travel will be limited to existing roads or within cleared and fenced areas to the greatest extent possible; no off-road travel will be allowed other than for direct access to a construction site.
    - Vehicle access travel will not be allowed within wetland habitats, without prior review and approval of the USFWS.
    - The monitoring biologist will inspect all exclusion fencing daily. If breeches in the fencing are found, the contractor will be required to repair damaged portions of the fence immediately. A survey for SFGS will be conducted prior to initiation of construction activities in that area.
    - Vehicle speed limits of 10 mph will be observed and monitored on the site until the site is cleared of SFGS. Once a site is cleared of SFGS, the speed limit can increase to 25 mph.
    - All entry gates to the west-of-Bayshore parcel, not used for construction access, will be locked and closed at all times to control access by unauthorized personnel.
    - Refueling of all heavy equipment, excluding cranes, will occur offsite and will be prohibited on the temporary trestle bridge or earthern berm roadway. A suitable refueling site will be established at the equipment storage yard or some other site outside of the west-of-Bayshore parcel.
    - All refueling of equipment on the vehicles will be done with dispensing hoses equipped with automatic shut-off nozzles (similar to those used at gas stations). The fuel handler will never leave the refueling operation while it is in progress. Repair equipment for the refueling hose and connections will be kept at the refueling site at all times.

  - All vehicles will carry a suitable fire extinguisher.
  - During the monitoring period, a written and photographic record of the work will be maintained by the biological monitors.

- An Environmental Awareness Training Program for the field crews to inform them of their responsibilities, and the sensitivity of the resources will be developed and administered by the monitoring biologist.

- A Site Restoration Soil Erosion Control Plan will be developed and given to the construction contractor and other key personnel. This plan will include an active revegetation program and suitable soil erosion control measures. This Plan will be approved by the USFWS, CDFG, and BART.

- An Emergency Response Plan will be developed and implemented by the construction contractor. This Plan will identify what types of events would require an emergency response, such as an accidental death of any SFGS due to field investigations, or some unexpected level of disturbance due to accident or equipment failure.

6.2 Habitat Enhancement Measures

These measures are proposed to compensate for any adverse direct effect the BART project may have on the SFGS population at the west-of-Bayshore parcel. These particular measures were developed during the informal consultation process with the USFWS over the past year and, in the views of the project sponsor, adequately mitigate for the adverse impacts to the SFGS anticipated at this time. These particular measures were selected because of their minimal impact to the landscape and yet maximum benefit to the SFGS habitat, and sensitivity to any future use of the west-of Bayshore parcel. The first set of Mitigation Measures would involve habitat enhancement measures on the west-of-Bayshore parcel and thus require the cooperation and approval of the SFIA, the property owner. BART and SFIA are presently conducting negotiations on the five onsite (the west-of-Bayshore parcel) mitigation measures described below. These onsite mitigation measures have been reviewed and approved by SFIA planning in concept (see Appendix C). In a recent letter to BART, the SFIA Administrator for the Planning and Environmental Affairs office (Mr. John Costas, December 22, 1995) indicated that the SFIA is "...committed to continue working with BART and the USFWS in developing scopes of work for these proposed mitigation measures". Once the final details of these five proposed mitigation measures are completed, the airport staff will proceed with the necessary approvals from the Airport Commission. These mitigation measures are included in this BA for USFWS consideration and concurrence, and for the development of more details by the USFWS, if needed.

These onsite mitigation measures are preferred by BART but could only be implemented with final approval and cooperation by the SFIA. Should the SFIA, BART and/or the USFWS be unable to agree with the proposed onsite mitigation measures, BART proposes a second set of mitigation measures for offsite (outside of the west-of-Bayshore parcel) locations. These locations and conceptual measures have been developed in discussions with the USFWS and land owners. A description of these offsite mitigation measures are presented for the USFWS consideration as an option if the negotiations for the onsite mitigation measures are not successful.

Onsite Mitigation Measures

Five basic mitigation measures involving the west-of-Bayshore parcel have been identified in concept to date. BART, SFIA and the USFWS have agreed upon the five mitigation measures in concept and are now in the process of defining and establishing the details of the mitigation measures to establish the roles and responsibilities of each agency in the final agreement. The following describes what details have been agreed to, in concept, between BART and the SFIA.

Mitigation Measure 1) Study to Characterize the Water Regimes on the West-of-Bayshore Parcel. At the present time the parcel supports a number of shallow drainage ditches, two major flood control canals (Cupid Row and South Lomita), seasonal wetlands of various sizes and depths, three water pump stations, and at least one underground drainage system of buried concrete box culverts. The USFWS has expressed an interest in gaining a better understanding of the ponding patterns and water movements of these wetlands and water features on the west-of-Bayshore parcel. The USFWS also expressed an interest in gaining an understanding of subsurface water movements throughout the parcel as well.

In this mitigation measure BART/SamTrans would sponsor a hydrologic study of the entire 180 acre west-of-Bayshore parcel to accomplish the following goals and objectives.

- Define surface and ground-water movement and water ponding regimes for the various wetlands and water bodies on the entire 180-acre west-of Bayshore parcel.

- Develop and suggest alternative modifications to three culverts connecting seasonal wetlands to South Lomita Canal in the southern portion of the west-of-Bayshore parcel to enhance habitat values of these wetlands for the California red-legged frog and SFGS by increasing the inundation or ponding period (see Mitigation Measure 2).

- Develop and suggest alternatives to manage the tide gates at the mouth of Cupid Row Canal to maximize freshwater habitats and thus, enhance habitat values for the California red-legged frog, SFGS and possibly the San Francisco forktail damselfly along this canal, while maintaining flood protection (see Mitigation Measure 3).

It is assumed that the suggested design modifications of the culverts (if necessary) connecting the seasonal wetlands to South Lomita Canal in the southern portion of the site (Mitigation Measure 2) will be done in a manner that will not increase the potential for flooding of the neighboring properties, or significantly increasing the extent of wetland habitats on the site, as directed by the landowner. BART will use the results of the hydrologic study to formulate a program to manage the tide gates to prevent salt water intrusion and enable fresh water habitats to recover (Mitigation Measure 3). It is assumed that this information may be used by the USFWS and SFIA for their use in developing a new Recovery Plan and/or long-term management program for the SFGS on the west-of-Bayshore parcel, respectivley.

BART will define further details and develop a final scope of work for this study in conjunction with the USFWS, PG&E, the mosquito abatement district, the surrounding cities, and the SFIA, in a series of meetings prior to the initiation of the study. The following is a listing of the tasks or subtasks for each of the three goals noted above.

Entire West-of-Bayshore Parcel. The USFWS has expressed an interest in better understanding the hydrologic regimes of the various wetlands on the west-of Bayshore parcel (the site) to aid in the understanding of how the hydrologic properties of the site are functioning and thus how habitat enhancement measures may be planned in consort with these properties. These tasks would be applicable to the entire site, including Cupid Row Canal and the seasonal wetlands at the southern end of the site, where habitat enhancement measures are planned to occur.

- Review of available past studies and hydrologic data sources including, but not limited to, studies and or file data collected on the west-of-Bayshore site by the SFIA, San Mateo County Flood Control District, CALTRANS, PG&E, or the cities of Millbrae and San Bruno. In addition, BART will utilize soil and groundwater data collected during the geotechnical investigation program for the proposed project. Other information sources of note would be local meteorological data from the SFIA, existing topographic maps of the parcel, historic photographs and maps, and field reconnaissance.

- Inventory and identify all major surface water inflow sources or watersheds and points of entry onto the west-of-Bayshore parcel. Characteristics of each inflow source that affect stormwater runoff will be described as well (size of watershed and degree of urbanization). The SFIA anticipates it will obtain clearance from the USFWS to dredge the South Lomita Canal prior to the completion of the BART extension. The hydrologic study will include consideration of this action in its inventory if the dredging, or approvals for dredging, are completed prior to the initiation of the study.

- Develop estimates of surface and subsurface water input to the site from off-site stormwater runoff and incident precipitation, using both monthly averages and representative wet, average, and dry rainfall years.

- Estimate the disposition of inputs onto the site during wet, average and dry rainfall years, taking into consideration storage capacity of surface depressions, routes and restrictions controlling surface runoff, water volume required to saturate soils above the summer-fall ground-water elevations, best estimates of lateral subsurface flow rates, and evapotransporation rates. Provide estimates of depth, duration, and spatial distribution of surface ponding throughout the site.

- Prepare topographic base maps with 0.2 or 1.0 foot contour intervals (whichever is available or feasible within the four month schedule) to assess on-site surface drainage, and to develop stage-volume relations for areas subject to seasonal ponding.

- Assess near-surface ground-water elevations and their fluctuations by the review of the existing data, or possibly by installing transects of shallow observation wells across the site.

- Assess soil horizonation, texture, and structure of both fill and underlying native soils from the review of the geotechnical testing data collected by BART on the site, with supplemental data from shallow test pits.

- Identify factors controlling infiltration and near-surface ground-water flows both up-gradient and down-gradient of ponded areas. Techniques that may be used may include laboratory measurements of permeability, onsite measurements of infiltration rates, or measurements of subsurface flow rates using suitable tracers. These techniques may be most suitable and appropriate in areas where intervening seepage barriers are suspected or may be critical to a proposed habitat enhancement site.

- The data collected may be used in a hydrologic model (such as the EPA's Storm Water Management Model, SWMM) to develop a water balance of the storm water drainage system and determine the connectivity between water bodies on the site.

Seasonal Wetlands in Southern Portion of the Site. The USFWS believes that the habitat quality of the seasonal wetlands at the southern end of the site can be improved for the California red-legged frog (the major prey base of the SFGS) by increasing the period of inundation or ponding. This would provide a longer breeding period for the red-legged frog in these seasonal wetlands. These tasks are designed to address this issue by exploring how the hydrologic regime of these wetlands may be altered by modifying the existing three culverts, in the least intrusive manner possible, that connect these seasonal wetlands to South Lomita Canal (Figure 1-2). In addition to the tasks noted above for the entire west-of-Bayshore parcel, this portion of the hydrologic study will include the following tasks.

- Assess the degree to which the existing culvert inverts control the duration of seasonal ponding in one of two ways. If the study is initiated and conducted through the wet season, the frequency of flows in the culverts will be compared to local rainfall and estimated runoff rates. Pond hydrographs and frequency and duration of culvert flows could be established through the temporary installation of water level recorders, or alternatively, through the installation of frequently-observed staff gauges and crest-stage gauges. If the study is conducted in the dry season, then an evaluation of indicator wetland plant composition at elevations proximal to the invert elevation will be conducted.

- Develop typical pond recession hydrographs to assess duration of ponding for a reasonable range of culvert elevations. This evaluation will include evapotransporation rates, as well as estimates of lateral seepage loss.

- Estimate the impact of raising culvert inverts on flooding potential of properties surrounding the site using a range of design storms in conjunction with the HEC-1 model. Influent hydrographs and surface water ponding elevations will be developed by the model.

- Assess likely impact of increased culvert invert elevations on aerial extent of seasonal wetland boundary and identify mitigation measures, if any, which would control possible increases in wetland area.

- Assess the effectiveness of alternative means of modifications to the culverts, including installation of larger or additional culverts in terms of achieving the desired goals and objectives. Provide recommendations on the most efficient, least intrusive, and least costly alternative.

Cupid Row Tidal Gates. The USFWS has noted that the reach of Cupid Row Canal that passes through the west-of-Bayshore parcel at one time supported freshwater habitats in which the

California red-legged frog and SFGS occurred. In the recent past, the aquatic salinity levels of this portion of the canal increased to a point that the freshwater emergent vegetation had essentially been eliminated from the canal. It is believed that this loss of freshwater habitat in the canal is due, in part, to the management of the tidal gates at the mouth of the canal. The following tasks are designed to address the possibility that salinity changes to this canal are due to the operations of the gates, or if they are due to saline groundwater inflows, not associated with the canal, and how to best manage the tidal gates, and maintain freshwater habitats along this portion of the canal.

- Monitor ground-water salinity and evaluate salinity gradients from locations adjacent to and far removed from, Cupid Row Canal to assess what degree, if any, saltwater intrusion of habitats may be attributed to saline ground-water inflows not associated with the canal.

- Identify existing operational objectives for the tide gates in consultation with the SFIA and San Mateo County Flood Control District (SMCFCD).

- Identify possible causes of salt water intrusion due to operations of the tidal gates and contrast with the design and operation of South Lomita Canal which has successfully restricted salt water intrusion. Investigations would take into consideration storm flows and water surface elevations on each side of the tide gates over a range of tide and runoff conditions.

- BART will use the results of the hydrologic study to formulate a program to manage the tide gates to prevent salt water incursions and enable freshwater habitats to recover along the canal. BART will then submit this proposed program to the USFWS and SFIA for review. A program agreeable to all parties will then be approved.

BART would complete this study in approximately four months. This time frame was selected in order to use the information and data to implement the habitat enhancement measures of Mitigation Measures 2 and 3. This hydrologic study would be conducted and completed prior to, or soon after, the initiation of construction of the BART extension project and submitted to the USFWS and SFIA.

Mitigation Measure 2) Alteration of Culverts to Seasonal Wetlands at Southern End of West-of-Bayshore Parcel. At the present time there are three culverts that run from the seasonal wetlands in the southern end of the west-of-Bayshore parcel into South Lomita Canal (see Figure 1-2). The USFWS has recommended that these culverts be altered so that the seasonal wetlands retain ponded water for a longer period of time, preferably through July in normal rainfall years. The basic goal of this habitat enhancement measure is to improve the habitat values of these seasonal wetlands for the California red-legged frog by allowing water to pond in the seasonal wetlands for a longer period of time and thus providing breeding and rearing habitat for the red-legged frog, a prime food source for the SFGS. The SFIA has requested that one of the criteria for this mitigation measure is that it be implemented in such a way as to avoid increasing the potential for flooding of the neighboring properties, or significantly increasing the aerial extent of wetland habitats in the immediate area. The goal and objective of this mitigation measure is to implement the proposed culvert modifications suggested in Mitigation Measure 1, and monitor each seasonal wetland to document any changes in wetland areas, periods of inundation, and red-legged frog populations associated with these wetlands.

BART will work with the USFWS, SFIA, and the City of Millbrae to select the most appropriate design modification of the culverts as defined in the Hydrologic Study to meet the goals and objectives stated above. BART will obtain agreements from the SFIA and the City of Millbrae to allow BART to implement appropriate means of altering the culverts identified in the Hydrology Study (Mitigation Measure 1) and agreed to by the resource agencies. BART will further define the details and develop a final scope of work for the monitoring element of this mitigation measure in conjunction with the USFWS and the SFIA prior to initiating alterations of the culverts. Once BART, USFWS and the SFIA have come to an agreement on the means of altering the culverts, and a final scope of work for the monitoring program is developed, BART would complete the following list of the tasks or subtasks for this mitigation measure.

- BART would implement the agreed upon design modifications, which may range from altering the existing culvert inverts, to replacing the culverts with larger and/or additional culverts.

- BART would be responsible for securing all permits that may be required for this work. BART will also be responsible for meeting all applicable conditions of these permits through the implementation phase of this mitigation measure.

- BART would then initiate a monitoring effort to determine to what degree the modifications of the culverts have achieved the goals and objectives of this mitigation measure. The monitoring effort will evaluate three parameters in comparison to baseline conditions: area of wetland habitat (using methods defined by the U.S. Army Corps of Engineers [USCOE] Wetland Delineation Manual), document increased retention time of ponded water in each wetland, and presence or absence of California red-legged frogs in the seasonal wetlands. Baseline conditions for wetland areas will be defined by the existing Wetland Delineation Report and maps for the west-of-Bayshore parcel prepared by BART and verified by the USCOE. These wetland boundaries will be monitored and checked each year to determine if there is a change in the aerial extent of these seasonal wetlands. Baseline data for surface water ponding in each seasonal wetland will be based upon a review of existing aerial photographs. After the culverts have been modified, ponding elevations (depth of water), and duration will be monitored each wet season, with the aid of the topographic maps and data collected from water level recorders or observations of staff gages, if schedules allow for the collection of such data. It will be assumed that the seasonal wetlands do not support any California red-legged frogs at this time, based upon the fact that past surveys have not identified any red-legged frogs in these wetlands. Monitoring efforts for the frog after the culverts have been modified will involve annual spotlight surveys.

The field program to modify the three culverts is scheduled to take no more than one month, and is expected to be completed prior to the BART project construction on the west-of-Bayshore parcel. The monitoring efforts will be initiated immediately after the culverts have been modified, and will extend for a minimum of five years. In the opinion of BART, a five year monitoring effort should be more than adequate to determine if this habitat enhancement effort is sucessful. Should the monitoring results indicate that the modified culverts are not resulting in the expected results and success criteria established by BART, USFWS and the SFIA, BART would then extend the monitoring effort or renegotiate the mitigation measure with the USFWS. BART will be responsible for the maintenance of the culverts for twenty years. BART will negotiate with the SFIA to determine if BART or a designated agent will maintain the cuverts, or if BART may establish an endowment fund for the Airport suitable to cover the labor, administrative and management costs to implement the maintenance program.

Mitigation Measure 3) Management of Cupid Row Canal Tidal Gates. The SMCFCD currently has the responsibility of managing and maintaining the tide gates at the mouth of Cupid Row Canal. These gates had been left open continuously in the recent past which has allowed the saltwater of the San Francisco Bay to travel up the canal and convert the freshwater habitats that once occurred along the canal on the west-of-Bayshore parcel to brackish water habitats. Brackish water habitats are not favorable for California red-legged frogs and other frog and toad species, the prime SFGS prey. It is also a habitat type that does not provide enough emergent vegetation cover for the SFGS.

The goals and objectives of this mitigation measure are to implement an appropriate management program as developed in Mitigation Measure 1, and to monitor the effectiveness of the program in enhancing freshwater habitats and populations of California red-legged frogs along Cupid Row Canal. The goal of restoring the freshwater habitats on Cupid Row Canal can be achieved by implementing an operating program for the tide gates that would keep them closed most of the year.

It is assumed that the extent of BART's responsibilities in the implementation of the tide gate management program will be limited to the management of the existing tide gate structures and canal configuration and not be extended to any required improvements to the existing facilities of canal capacity. BART/SamTrans would develop a detailed scope of work and agreement with SFIA and USFWS on responsibilities, funding, management and maintenance of the tide gates. The SFIA would retain the flood control responsibilities of and liabilities for Cupid Row Canal.

BART will work with the USFWS and SFIA to select the most appropriate management program of the tide gates at the mouth of Cupid Row Canal, as defined in the Hydrologic Study, to meet the goals and objectives stated above. BART will develop an agreement with SFIA, with concurrence from the USFWS, on responsibilities for the management and maintenance of the canal and flood control gates. BART will further define the details and develop a final scope of work for the monitoring element of this mitigation measure in conjunction with the USFWS and the SFIA, prior to the implementation of the tidal gate management program. Once BART and the SFIA have come to an agreement on the tidal gate management program, and a final scope of work for the monitoring program, BART would complete the following list of the tasks or subtasks for this mitigation measure.

- BART would implement the agreed upon tidal gate management program.

- BART would assist the SFIA in securing all permits that may be required for this work and would be responsible for meeting all applicable conditions of these permits through the implementation phase of this mitigation measure.

- BART would then initiate a five year (minimum) monitoring program to determine to what degree the selected tidal gate management program has achieved the goals and objectives of this mitigation measure. The monitoring effort would evaluate the development of freshwater habitats and the red-legged frog population along Cupid Row Canal. Baseline and subsequent habitat conditions will be based upon a habitat survey before and immediately

> after the tidal gate management program has been initiated. Habitat parameters to be evaluated will include water salinity levels, and the extent of freshwater emergent vegetation. Water salinity will be measured at regular intervals for highest high tide, high tide, low tide, and lowest low tide events throughout the year. The extent of freshwater emergent vegetation will be mapped in the spring of each year. Baseline and subsequent year red-legged frog populations will be determined by annual evening spotlight surveys.

BART would assist the SFIA and USFWS in reaching an agreement on the proper maintenance of the flood control capacity within the canal. In the past, the SMCFCD maintained the canal with a "grade-all" (a type of equipment) and disposed of the spoils onsite. The only limitations the CDFG placed on this maintenance activity was to establish a period of time during which this maintenance activity could occur to avoid SFGS as much as possible, and to maintain existing two foot benches on both sides of a low flow channel within the canal. Recently the CDFG has objected to leaving the spoils on the site and has required the District to remove them from the site. The SFIA would retain the responsibility and any liabilities of maintaining the flood control capacity of the canal.

The selected management program for the tide gates would be implemented before construction of the BART extension on the west-of-Bayshore parcel has been initiated. BART would be responsible for monitoring the success of the agreed upon management and maintenance actions. The criteria for success will be improved freshwater habitat for the SFGS and California red-legged frog. BART would submit annual monitoring reports to the USFWS and CDFG through the monitoring period (minimum of five years). These monitoring reports will assess the overall effectiveness of the program and will include photographic documentation. Should the monitoring results indicate that the selected gate management program is not resulting in the expected results and success criteria established by BART, USFWS and the SFIA, BART would then extend the monitoring effort or renegotiate the mitigation measure with the USFWS.

BART would be responsible for maintaining the tidal gate management for twenty years. BART will negotiate with the SFIA to determine if BART or a designated agent will continue to operate the gates, or if BART may establish an endowment fund for the Airport suitable to cover the labor, administrative and management costs to implement the tidal gate management program.

Mitigation Measure 4) Bullfrog Abatement Pilot Program. In recent years, it appears that the non-native bullfrog *(Rana catesbeiana)* has been introduced and is increasing in numbers on the west-of-Bayshore parcel. The bullfrog preys upon both the California red-legged frog and the SFGS, and is known to have eliminated populations of the California red-legged frog at other sites. The goals and objectives of this habitat enhancement measure is to determine what type(s) of bullfrog abatement measures would be most successful for this site and thus, improve the California red-legged frog and SFGS habitat by eliminating, or significantly reducing the population of bullfrogs on this property. A variety of abatement methods would be used and monitored in a three year pilot study. The program will focus upon South Lomita canal, Cupid Row canal, and the large seasonal ponds on the west-of-Bayshore parcel. Those methods or combination of methods that are considered the most successful would then be implemented in a longer term bullfrog abatement program to be coordinated with SFIA.

BART will define further details and develop a final scope of work for this program in conjunction with the USFWS and the SFIA prior to the initiation of the study. The following is a listing of the tasks or subtasks for the goals and objectives noted above.

- South Lomita Canal. First year, pump canal dry, if feasible, for 1-2 days and remove bullfrogs from remaining small ponds by seining and gigging in August. For 2 years thereafter, implement a one week gigging program both in August and September.
- Cupid Row Canal. First year and thereafter, as required, for a total of 3 years, gig bullfrogs in canal on the west-of-Bayshore parcel over a one week period in August and September.
- Large seasonal ponds. First year and thereafter, as required, for a total of 3 years, gig bullfrogs in seasonal wetland over a one week period in August and September. Depending upon rainfall and duration of ponding, pumping of water may also be necessary, prior to gigging.

The pilot bullfrog abatement program would begin prior to the initiation of BART construction on the west-of-Bayshore parcel, and cease if SFGS and/or the California red-legged frog becomes extinct on the site. BART would be responsible for funding and implementing the first 3 years of the program and required monitoring efforts to evaluate the effectiveness of the various methods used.

BART will be responsible for continuing the bullfrog abatement for twenty years. BART will negotiate with the SFIA to determine if BART or a designated agent will continue to implement the program, or if BART may establish an endowment fund for the Airport suitable to cover the labor, administrative and management costs to implement the program.

Mitigation Measure 5) SFGS Capture Feeding Program. The goals and objectives of this mitigation measure are to promote the successful maturation of young SFGS and survival of adults during the construction of the BART extension project on the west-of-Bayshore parcel. The snakes would be removed from construction sites, held in capitivity and fed; and then re-introduced into the west-of-Bayshore parcel, once construction is completed. For purposes of this proposal, it is assumed that the capture of snakes will be permitted under the BART Section 9 permit. Captured SFGS's would be removed from construction sites on the west-of-Bayshore parcel prior to the initiation of construction activities, and retained in an approved institution until construction is completed. The release of captured snakes back onto the west-of-Bayshore would be determined in conjunction with USFWS and SFIA.

BART will define further details and develop a final scope of work for this program in conjunction with the USFWS and the SFIA prior to the initiation of the program. The following is a listing of the tasks, subtasks, and conditions designed to meet the goals and objectives of the captive feeding program.

- BART would prepare an agreement with holding institution for program. This institution is likely to be an established research facility such as the California Academy of Sciences, University of California or California State University, or the San Francisco Zoo.

- The institution contracted to accomplish captive feeding would be informed that departure from the conditions of the Biological Opinion is likely to harm SFGS and that such harm is not permitted and would constitute a violation of Section 9 of the Federal Endangered Species Act.

- Tunnel traps would be placed at locations along a drift fence surrounding each construction site. These traps would be placed each morning for six weeks in the spring and would be periodically inspected during the day. The traps would be constructed in accordance to a prototype provided by the USFWS and would be covered with wood or vegetation to protect trapped SFGS.

- BART would remove snakes prior to construction, and transfer to an authorized institution. No snakes would be handled with bare hands, unless by persons currently named under an existing section 10 permit or employees of the institution contracted to do the captive feeding of the snakes. All traps which contain a SFGS would not be opened by the monitoring biologist unless other animals are in the trap that may harm the SFGS. In those cases, the other animal would be released on-site, except for bullfrogs which would be removed from the site. Trapped SFGS are to be retained in their traps and placed in a large white cotton bag and stored on-site in the shade until the end of the work day, at which point the trap and snake would be transported to the contracted institution.

- Captive fed snakes would be held in full quarantine conditions with no contact with any other captive snakes, unsterilized cages, or bedding of any other snakes of any species.

- The captive-fed SFGS would only be fed ranid frogs or, if they are fed fish, thawed fish that were frozen for a minimum of 60 hours.

- The captive-fed SFGS would not be bred to snakes of any other species.

- Captive-fed snakes would be released on-site as directed by the USFWS.

Based upon planned construction on west-of-Bayshore property, the capture feeding program would continue for the duration of project construction.

Offsite Mitigation Measures

As noted above, these mitigation measures would only be employed if for some reason the on-site mitigation measures were infeasible. BART favors the on-site mitigation measures as a first option and is in the process of conducting negotiations with the USFWS and SFIA.

Wetland Creation Immediately Offsite. If the SFIA can not concur with implementation of the Mitigation Measures above in a timely manner, BART will enhance and create wetland habitats on the property west of the CalTrain tracks between the tracks and San Antonio Avenue, as feasible. There are at least three different potential mitigation sites west of the CalTrain tracks that have been identified by BART and considered in concept to date. The feasible acreage for wetland development ranges between 1.4 acres to 2.9 acres, depending upon how much land will be made available by the property owners.

Purchase of Offsite Location and Establishment of Management Endowment. If onsite mitigation is infeasible BART will purchase a 244 acre parcel of land in the southwestern portion of San Mateo County (Steele Ranch) where there is an existing SFGS population. It has been expressed by USFWS (personal communication. Alison Willy, Biologist, USFWS, 1995) that acquiring and securing the Steele Ranch parcel for SFGS habitat would be acceptable as a mitigation measure. Point Año Nuevo State Reserve, which is maintained by the California Department of Parks and Recreation (CDPR), may be considered a possibility for management of the SFGS habitat by integrating this part of the Steele Ranch into their own holdings. The CDPR has procured and assumed stewardship of several parcels in this area, and has expressed interest in continuing this practice. There is currently a management plan on Point Año Nuevo State Reserve property for the SFGS habitat which borders Steele Ranch. Management of Steele Ranch habitat could be incorporated into this existing plan. A monetary endowment may be set up to provide the CDPR with the necessary funds to expand the SFGS management plan to accommodate the additional parcel.

7. DETERMINATION OF EFFECT

Based upon the effect analysis and conservation measures described above, it is determined that the proposed BART extension project to the SFIA would be "not likely to adversely effect" the SFGS, California red-legged frog, and San Francisco forktail damselfly on the west-of-Bayshore parcel.

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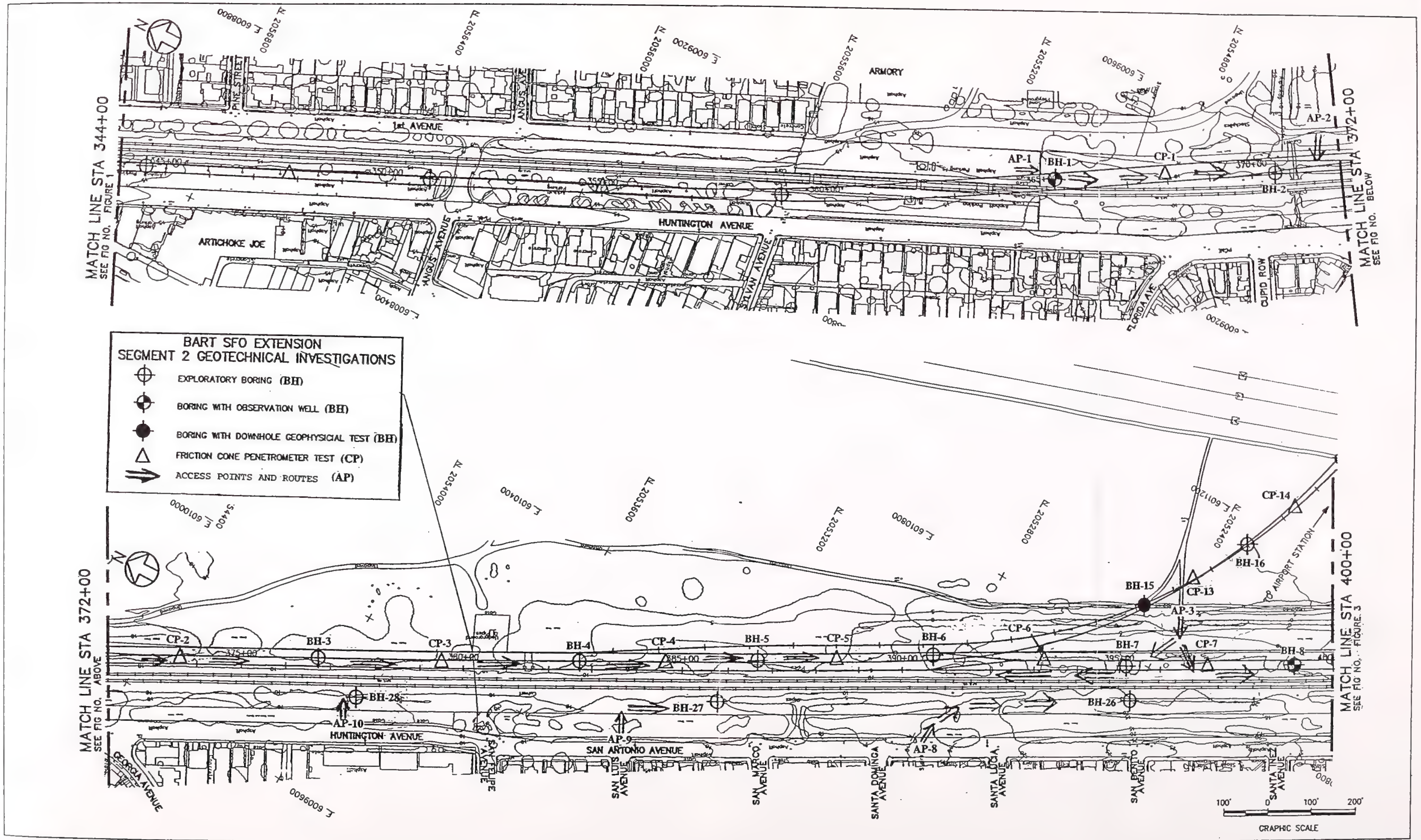
APPENDIX A

BART - San Francisco Airport Extension
Wye - Stub Option
Field Geotechnical Investigation Program Graphics

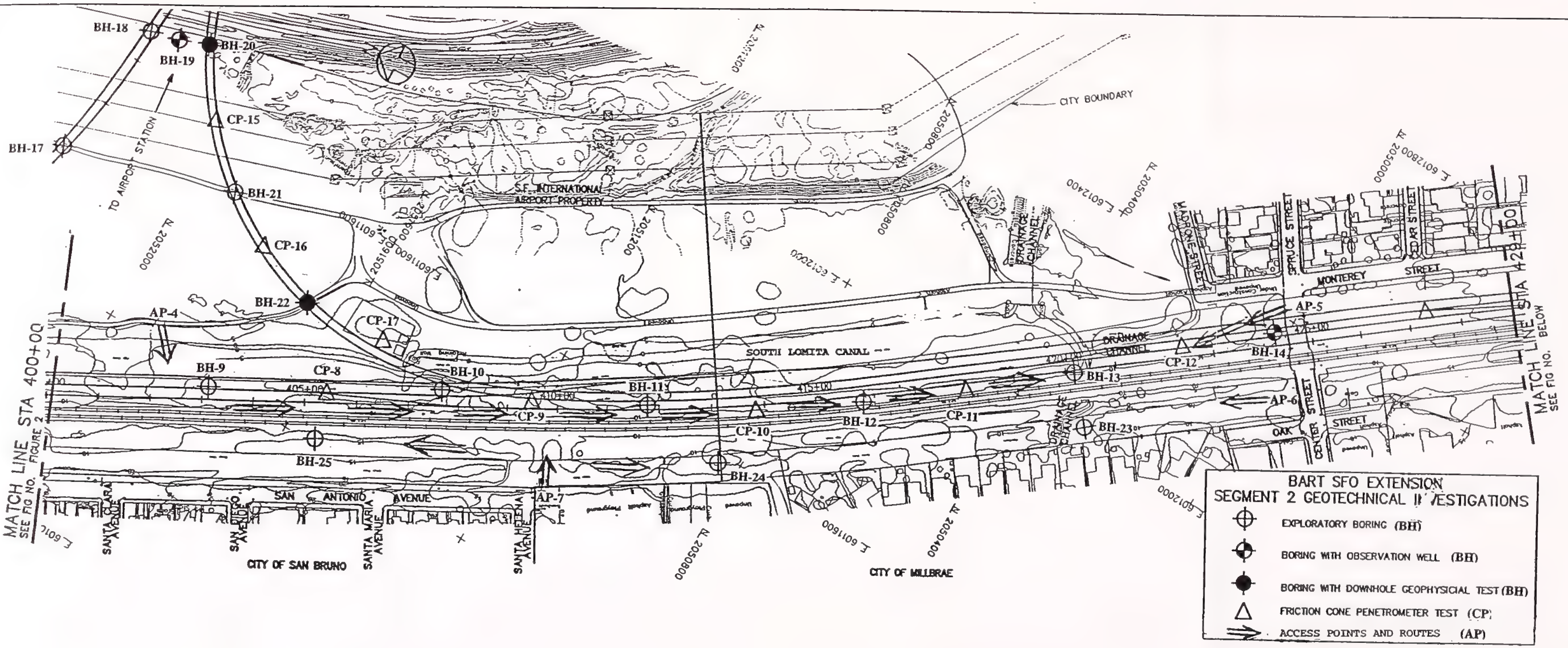


OGDEN

Proposed Geotechnical Test Site Locations On and In Immediate Vicinity of West-of-Bayshore Parcel

FIGURE

A

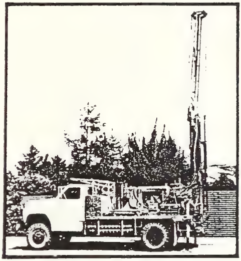


OGDEN

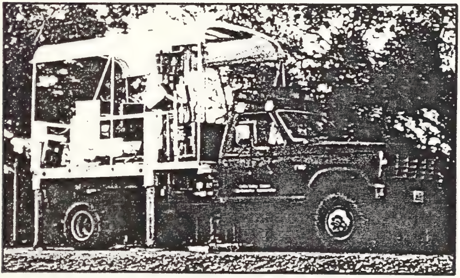
Proposed Geotechnical Test Site Locations On and In Immediate Vicinity of West-of-Bayshore Parcel

FIGURE

B



PHOTOGRAPH 1 - TYPICAL DRILL RIG



PHOTOGRAPH 2 - TYPICAL CONE PENETROMETER RIG

OGDEN

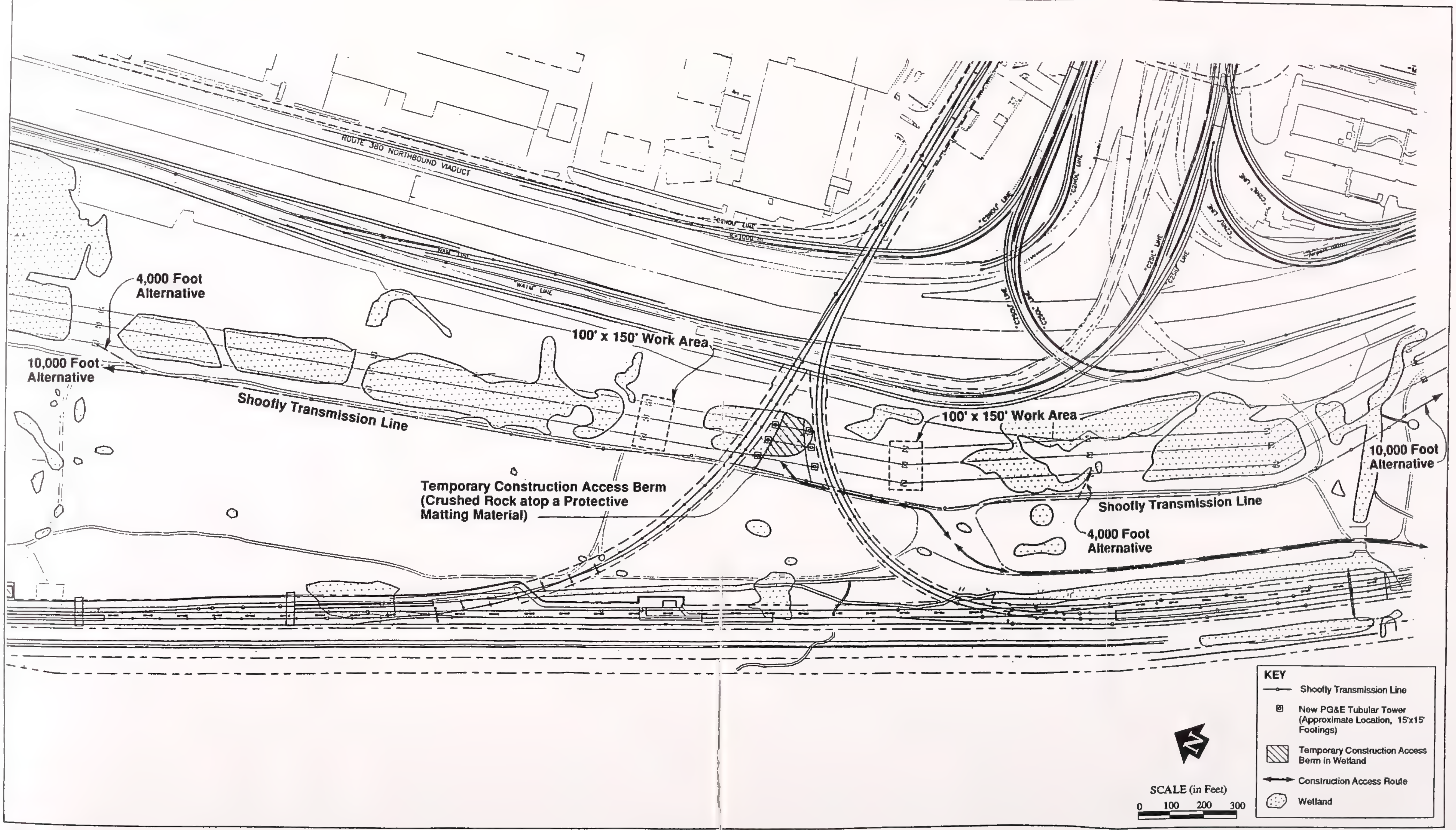
Typical Drill and Cone Penetrometer Rigs

FIGURE

C

APPENDIX B

Figure A: Alternative 1C
Overhead Transmission on New Tubular Towers


ROUTE 380 NORTHBOUND VIADUCT
R=1000 m
4,000 Foot Alternative
10,000 Foot Alternative
Shoofly Transmission Line
100' x 150' Work Area
Temporary Construction Access Berm (Crushed Rock atop a Protective Matting Material)
100' x 150' Work Area
10,000 Foot Alternative
Shoofly Transmission Line
4,000 Foot Alternative
SCALE (in Feet)
0 100 200 300
KEY
Shoofly Transmission Line
New PG&E Tubular Tower (Approximate Location, 15'x15' Footings)
Temporary Construction Access Berm in Wetland
Construction Access Route
Wetland

OGDEN

Alternative 1C - Overhead Transmission on New Tubular Towers

FIGURE

A

APPENDIX C

SFIA Documentation in Support of Proposed Conceptual Mitigation Measures

Airports Commission
City and County of San Francisco
Frank M. Jordan
Mayor

Patrick A. Murphy
President
L. Andrew Jeanpierre
Vice President
Marie K. Brooks
Michael S. Strunsky
Roland A. Quan

LOUIS A. TURPEN
Director of Airports

San Francisco International Airport
GATEWAY TO THE PACIFIC

November 7, 1995

Ms. Shirley L. Douglas, Planning Manager
San Francisco Airport Extension
Bay Area Rapid Transit District
1000 Broadway, 4th Floor
Oakland, CA 94604-2688

Subject: Mitigation Concepts

Dear Ms. Douglas:

We appreciate receiving the revised version (dated 10/26/95) of BART's conceptual approach to possible U.S. Fish and Wildlife Service (FWS) mitigation measures for BART's project on San Francisco International Airport's (SFIA) west-of-Bayshore parcel. The revisions provide further clarification of BART's proposal for FWS consideration while acknowledging SFIA's continuing obligation and authority to manage the west-of-Bayshore parcel.

With the revisions, SFIA staff is prepared to recommend that the Airports Commission approve BART's proposed conceptual approach including the five short-term mitigation measures. We will bring this recommendation to the Airports Commission for action at its November 21 meeting. If the Airports Commission gives its conceptual approval, detailed scopes of work for the individual measures must be developed for further review and approval by SFIA. SFIA will cooperate with BART and the FWS in developing these detailed scopes of work. Once the details of these proposed mitigation measures are known, the Commission would, of course, have to approve the use of SFIA property for these purposes.

As you know, SFIA is in the process of establishing a task force with Fish and Wildlife Service to develop a comprehensive, long-term maintenance-management plan for SFIA's west-of-Bayshore parcel. We appreciate BART's commitment to participation in this task force. Our initial objective is the timely development of BART's short-term mitigation program. Thus, we would not recommend delaying approval of the conceptual approach pending development of a comprehensive, long-term maintenance-management plan. Of course, for SFIA the long term plan remains very important.

We look forward to our joint meeting with you and representatives from the Fish and Wildlife Service. We will coordinate the meeting arrangements with you.

Sincerely,

John Costas
Administrator
Planning & Environmental Affairs

cc: Takis Salpeas
Senior Staff

AIRPORT COMMISSION

CITY AND COUNTY OF SAN FRANCISCO

RESOLUTION NO. ______________

WHEREAS, On July 25, 1995, by Resolution No. 95-0175, this Commission determined the location of a BART station at the San Francisco International Airport (SFIA), designated Option X; and

WHEREAS, On September 19, 1995, by Resolution No. 95-0258, the Commission accepted BART's passenger quality standards for the design of the Airport BART station designated as Concourse H; and

WHEREAS, This Commission authorized the Director to take all steps necessary to effect implementation of such BART station; and

WHEREAS, This Commission has the authority and responsibility to wisely manage Airport property and ensure the ability to develop facilities to meet future needs; and

WHEREAS, The BART alignment for the Airport BART station will cross the SFIA parcel located west of the Bayshore Freeway which is known to serve as habitat of endangered species; and

WHEREAS, BART must mitigate the potential effects of its project on these endangered species; and

WHEREAS, BART has proposed a conceptual approach, comprised of five measures, described in Attachment A (dated October 26, 1995) attached, which would be implemented on the SFIA parcel located west of the Bayshore Freeway to mitigate the project effects on the endangered species; and

WHEREAS, BART is seeking conceptual approval of these five proposed mitigation measures before they are formally submitted to the United States Fish and Wildlife Service (FWS) for its approval; now therefore be it

RESOLVED, That this Commission hereby grants conceptual approval of the five mitigation measures proposed by BART acknowledging that (1) detailed scopes of work will be prepared for each measure for further review and approval by SFIA and (2) Commission approval will be required before these measures can be implemented; and, be it further

RESOLVED, That this Commission directs the Director to cooperate with BART and the FWS in developing the detailed scopes of work.

I hereby certify that the foregoing resolution was adopted by the Airports Commission

at its meeting of ______________________________

____

Secretary

United States Department of the Interior

IN REPLY REFER TO:

FISH AND WILDLIFE SERVICE
Ecological Services
Sacramento Field Office
2800 Cottage Way, Room E-1803
Sacramento, California 95825

[illegible]
FEB 27 1996
SYSTEM SAFETY DEPT

In Reply Refer To:
1-1-96-I-448

February 23, 1996

Mr. Stewart F. Taylor
Regional Administrator
U.S. Department of Transportation
Federal Transit Administration
Region IX
201 Mission Street
San Francisco, California 94105-1800

Subject: Clarification Request on the BART San Francisco Airport Extension Final Biological Assessment for the San Francisco Garter Snake and the California Red-legged Frog

Dear Mr. Taylor:

In 1993 the U.S. Fish and Wildlife Service (Service) and the San Francisco Bay Area Rapid Transit (BART) began informal consultation on the proposed San Francisco Airport light-rail extension. The purpose of this informal consultation was to reduce the likelihood of conflicts between listed species and the proposed action before formal consultation was initiated. During the informal consultation process, several meetings were held to decide appropriate methods to minimize and mitigate for impacts to the endangered San Francisco garter snake (*Thamnophis sirtalis tetrateania*) and the proposed endangered California red-legged frog (*Rana aurora draytonii*). The Service felt very optimistic about the measures agreed to during the consultation process and believed that a reasonable project had been designed that contained appropriate mitigation to provide for the protection of these sensitive species.

On January 26, 1996, the Service received the final BART San Francisco Airport Extension Project Biological Assessment (BA) for the San Francisco Garter Snake and the California red-legged frog. Although the Service has not been able to complete our full review of the document at this time, we feel it is important to contact you immediately for clarification on certain aspects of the document that conflict with offers made during informal consultation.

The specific actions described in the BA appear to be only those that require agreement from the landowner, the San Francisco International Airport (SFIA), not the suite of mitigation measures needed to reduce the impacts of the proposed project on the San Francisco garter snake population.

For example, the BA states that offsite mitigation measures will be employed only if the on-site mitigation measures are infeasible. The offsite mitigation measures are said to include the creation of wetlands adjacent to the West-of-Bayshore property and the purchase of suitable habitat at an offsite location (Steele Ranch). Although consultation included discussions of the importance of upland sites to the San Francisco garter snake and the California red-legged frog, there is no discussion in the BA of how upland sites will be restored and/or compensated for. This is not the mitigation scenario that the Service had been led to believe would occur. In fact, during consultation with the Service, BART agreed to (1) implement the five on-site mitigation measures included in the final BA and (2) compensate for impacts to species habitat at a ratio of 3:1. Compensation was not discussed in early meetings with BART because (a) earlier versions of the environmental documents for the proposed project assumed a 3:1 compensation ratio for impacts to habitat and (b) the original consultation involved alternative 6, which would tunnel under the West-of-Bayshore parcel, and did not involve permanent loss of occupied San Francisco garter snake habitat. Once the proposed project description began to change and unavoidable impacts to the species habitat became apparent, the Service began to include 3:1 compensation in the consultation discussions. In addition, the Service agreed to allow BART to purchase Steele Ranch for compensation, if BART was unable to carry out the five on-site mitigation measures; however, the Service would still require the 3:1 compensation for direct impacts. Ms. Karita Zimmerman of BART, verbally committed to a 3:1 compensation ratio during a July 21, 1995, meeting with the Service. In a January 12, 1996, telephone conversation between Mr. Michael Thabault of my office and Ms. Karita Zimmerman and Ms. Kathleen Pahl of BART, Mr. Thabault explained that the Service was looking for a 3:1 habitat compensation ratio at a site on or adjacent to the West-of-Bayshore property. Mr. Thabault also stated that in the event that BART couldn't meet this compensation requirement, the Service would accept a 1:1 ratio using property on or adjacent to the West-of-Bayshore site and that additional offsite mitigation would require a higher ratio. That conversation also identified the need for any compensatory wetland mitigation to benefit the San Francisco garter snake directly. In reviewing the environmental documents and the meeting and telephone conversation records, it is clear that both the Service and BART intended to include this compensation component as part of the mitigation for the proposed project. Therefore, the BA has incorrectly described or inadvertently omitted the mitigation alternatives.

In addition, the Service and BART discussed the need for captive holding and subsequent release of San Francisco garter snakes to assure that individuals survive the action and that the site can be repopulated. Drift fences and traps were to be placed around the construction area, and all individuals found were to be held in captivity until after project completion. Snake exclusion fencing was discussed in the BA, but the trapout of snakes that is needed to prevent the animals from being injured or killed during excavation has apparently been omitted. Also, it was agreed during consultation that the Service would be given access to the site for monitoring, sampling, and reintroduction of the San Francisco garter snake and California red-legged frog.

The Service has concerns about the inclusion of the rail car wash facilities in the final BA. In the July 21, 1995, meeting with BART, Ogden Environmental and the Service, Ms. Alison Willy of my staff requested the removal of the proposed car wash facility and auxiliary tracks that were planned for the east side of the CalTrain tracks between Santa Inez and Santa Clara Avenues. At that time, Ms. Willy was told by Mr. Ric Villaseñor of Ogden Environmental, that the location of the rail car wash was going to be moved and the General Manager would make a decision on the new location in mid-August. When Ms. Willy subsequently saw that the proposed facilities had not been moved, she again informed Mr. Villaseñor on October 23, 1995, that it was imperative that the facilities be removed from the proposal or moved to an off-site location. A storage/staging area was also erroneously included in the final BA. During consultation on the original alternative 6 project proposal, the Service requested the relocation of the storage/staging facilities to an off-site location. BART subsequently agreed to this request. On-site storage/staging facilities were not even discussed under the wye-stub alternative. The Service is concerned about the inclusion of these facilities in the final BA and would like clarification from the Federal Transit Administration (FTA).

The BA states that "Installation of the new tubular towers would require the placement of a temporary construction access berm approximately 50-75 feet in width within the wetland area between the two aerial wye-stubs." However, this access berm was not included in any of the environmental documents for this project, nor was it discussed during consultation. The Service believes that alternatives to berming exist; however, if construction of a berm is necessary, appropriate mitigation for impacts would be required. The BA also states that, "Depending upon when the construction is to occur, it may be necessary to improve and convert the dirt roads to all weather roads to the construction site by adding gravel to the existing roads." The need to convert dirt roads on the site was never mentioned in consultation or in the environmental documents and has not been approved by the Service. If improvements to the dirt roads are necessary, the Service feels additional mitigation is needed.

The description of project construction activities is incomplete and incomprehensible. For example not only are the descriptions of at-grade line, retained fill, and cut-and-cover sections unclear, the BA does not explain where these sections will be used. The project description section needs to be rewritten in order for the Service to initiate formal consultation. In addition, the "Effects of the Proposed Action" section does not provide exact acreage totals for the permanent and temporary impacts to wetlands and uplands at the West-of-Bayshore site. This information must be provided so the Service can adequately address the impacts of the proposed project.

Finally, the FTA has used the incorrect terminology in the Determination of Effect section of the BA. According to the BA, the FTA has determined that the proposed BART extension to the San Francisco International Airport (SFIA) is "not likely to adversely effect" the San Francisco garter snake and the California red-legged frog. However, BART was informed at all meetings that the action was not only likely to adversely affect the San Francisco garter snake but was likely to extirpate one of the few remaining populations of the species and, due to the low numbers of snakes in the remaining populations, the action could preclude survival of the species. Therefore, a "likely to adversely affect" determination would be more appropriate.

Once it is decided that a proposed project is likely to have an adverse affect on a listed species, formal consultation is required. The purpose of formal consultation is to insure that any action if authorized, funded, or carried out by a Federal agency, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. This final determination is the responsibility of the Service, not the project proponent.

The Service believes that a reasonable project can be designed that contains appropriate mitigation to provide for the protection of the San Francisco garter snake and California red-legged frog. Past consultation with BART appeared to be highly productive, and the Service believed that an agreement on appropriate mitigation measures had been reached. However, measures as agreed to were not incorporated into the final BA. The Service would prefer to consider the January 1996 Biological Assessment as a draft and is requesting that corrections be made to the mitigation measures to reflect what was actually agreed upon during the consultation process. However, if FTA directs the Service to accept the BA as the final version and to conduct our formal consultation using this document, we will proceed to do so. Please notify our office within the next 30 days of your decision. If you have any questions, please contact Ms. Kelly Geer of my office at (916) 979-2752.

Sincerely,

Joel A. Medlin

Joel A. Medlin
Field Supervisor

cc: ARD, Klamath and California Ecoregions, Region 1, Portland, Oregon
Ms. Karita Zimmerman, BART
Carl Wilcox, CDFG
Wetlands branch

BART

BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street - Lake Merritt Station
P.O. Box 12688
Oakland, CA 94604-2688
Telephone (510) 464-6000

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MICHAEL BERNICK
9TH DISTRICT

April 16, 1996

Mr. Joel A. Medlin
Field Supervisor, Ecological Services
US Fish and Wildlife Service
Sacramento Field Office
2800 Cottage Way, Room E-1803
Sacramento, CA 95825

Subject: Clarification on BART-San Francisco Airport (BART-SFO) Extension Biological Assessment (BA) for the San Francisco Garter Snake (SFGS) and the California Redlegged Frog

ID#: 1-1-96-I-448

Dear Mr. Medlin:

The Federal Transit Administration (FTA) and the San Francisco Bay Area Rapid Transit District (BART) have received the February 23, 1996 comment letter from the U.S. Fish and Wildlife Service (USFWS) regarding the Biological Assessment for the proposed BART-San Francisco Airport Extension project submitted January 26 (referred to as the Final BA). Leslie Rogers, Acting Regional Administrator for the FTA, has given BART the authority to respond to this letter.

Since the receipt of your letter, BART staff has had several productive discussions with USFWS staff on key points of concern. This letter reflects our continued efforts be responsive to potential impacts to endangered species habitat. BART staff greatly appreciates the time your staff has taken to assist us with this project. In particular, we acknowledge the time taken to review and meet with BART staff on the Biological Assessment as well as efforts to visit the project site.

On behalf of the FTA and BART staff, I would like to state that prior to receiving this letter we believed we were making every effort to be responsive to USFWS concerns and to mitigate or adequately compensate for anticipated impacts to SFGS and SFGS habitat on the west-of-Bayshore parcel and regret any miscommunication or misunderstanding that has taken place during the informal consultation process for this proposed project. BART staff has worked, and will continue to work, diligently to respond to USFWS requests and the need to protect the sensitive species and habitat.

The proposed BART extension to the San Francisco International Airport is a complex project and is further complicated by an intricate Design-Build implementation process. As your staff is aware, the opportunities to compensate for those impacts that are unavoidable to the species and to SFGS habitat on the west-of-Bayshore parcel have been severely limited by the constraints established by the landowner, the San Francisco International Airport. The limited number of alternative locations off-site for the enhancement of SFGS habitat that adequately compensated for anticipated impacts to SFGS habitat further exacerbate the problem. BART has nevertheless diligently sought to develop a mitigation proposal which is potential impacts to sensitive species.

As you know, a draft BA was submitted to your office on November 9, 1995 with the same project elements and proposed mitigation measures as were presented in the Final BA. The purpose of the draft BA was to obtain feedback and clarification from the USFWS on the additional elements of the project and mitigation measures BART was proposing. BART staff had made a number of follow up phone calls regarding project elements/proposed mitigation measures that were changing from what was discussed during the informal consultation process to date. In addition, a facsimile was sent (December 13, 1995) detailing additional project requirements for the Pacific Gas and Electric Company (PG&E) transmission line relocation. Unfortunately, due to the unexpected federal furlough periods at the end of 1995 and beginning of 1996, and the short time frame in which the project sponsors would like to develop the elements of the proposed project and proposed mitigation contained in the Final BA had apparently not been completely reviewed by the USFWS during the informal consultation process. In any event, assuming general consultations, BART submitted the Final BA on January 26, 1996.

Below are point-by-point responses to the components in your letter of February 23, 1996, and conversations with your staff on March 13, 21, and 28. BART would request the USFWS to consider proposals in this letter as amendments to the Final BA and continue to formal consultation period. We would hope that this provides sufficient clarifications and modifications to the Final BA to satisfy your concerns.

1. Framework of the BA. In general, the project description in the Final BA included elements which took into consideration project cost, neighborhood impacts, and operational constraints as well as impacts to sensitive habitats. The Final BA contained only mitigation to which BART could fully commit, given the current constraints of property ownership. Therefore, some project elements and mitigations which were discussed between BART and USFWS staff during the informal

consultation process were not included in the Final BA. Where it was not possible for BART to make a firm commitment, as with developing habitat west of the CalTrain tracks due to conflicts of multiple property ownership, commitments for mitigation were qualified "as feasible".

2. 3:1 Wetland Habitat Mitigation. The USFWS request to mitigate loss of habitat wetlands at a 3:1 ratio was taken seriously into consideration by BART. This issue was addressed by providing 3:1 wetland replacement for permanent wetland take in SFGS habitat areas (estimated at that time to be approximately 0.65 acres). This wetland mitigation was proposed in the Section 404 Permit Application and is located at the Colma Creek area in South San Francisco. No other areas for potential wetland/habitat development were identified which could support the SFGS and for which BART could provide firm commitments. Attachment A includes supporting background on the constraints to development of wetland habitat in the project area.

3. Proposed Restoration Plans. The Final BA provided a general plan to restore habitats temporarily disrupted by BART construction. More explicit plans have been developed and were provided in the Section 404 Permit application and the BA for the Initial Geotechnical Program.

   In response to the comments by USFWS, Attachment B contains further elaboration on the restoration guidelines proposed by BART as part of the mitigation for temporary construction impacts.

4. Clarification of Captive Feeding Program. Trapout of snakes was anticipated as part of the Captive Feeding Program discussed on pages 47 and 48 of the Final BA. After fencing the construction area, BART plans to trap snakes as they exit the construction area. The USFWS would be consulted regarding specific recommendations on trapping methodology in the construction area. BART had already anticipated that USFWS would have access to their jurisdictional areas during project construction and during the monitoring period afterwards.

5. Relocation of Carwash. In order to provide adequate maintenance of BART vehicles in the expanding system, a carwash is needed on the San Francisco Peninsula. As part of the proposed project, a carwash was proposed adjacent to the west-of-Bayshore property. This site was selected because it was the only at-grade area at the end of the corridor with sufficient surface area and that was cost-effective, thus meeting key criteria for locating the facility. Nevertheless, BART staff investigated

relocation of the carwash after being so requested by USFWS staff. Further investigations and analysis resulted in the conclusion that other locations would require extremely costly engineering to create room for a functional carwash above or below grade In addition, a carwash located toward the middle of the alignment was estimated to add annual operating costs in the millions of dollars. Therefore, the carwash was retained in the Final BA at the west-of-Bayshore site.

However, in response to the further comments of the USFWS, BART will commit to relocate the carwash out of the west-of-Bayshore habitat area. This change to the project will reduce impacts to South Lomita Canal as identified in the Final BA and the Section 404 Permit Application.

6. Location of Construction Staging Area. A construction staging area is necessary to construct the aerial wye stubs into the Airport. The staging area needs to be of suitable size (minimum of 3 acres), configuration (rectangle) and location (adjacent to aerial wye stub construction sites) to function as a viable and economic staging area. BART has been able to identify only three locations which are suitable for construction staging areas, one off of the west-of-Bayshore parcel and two located on the west-of-Bayshore property. These areas are more fully described in the DEIR/SDEIS and the FRDEIR/S#2DEIS. Site "C" appeared to be the best location for construction staging from the project implementation perspective and was included in the Final BA.

   In response to the comments of the USFWS, BART continues to propose use of laydown area "C" but will provide mitigation at a compensation ratio suggested by USFWS.

7. Temporary Construction Access for PG&E. PG&E staff were developing their construction scenario concurrently with the BART/USFWS informal consultation process. In December 1995, BART obtained the construction scenario which PG&E suggested was required to install the new tubular towers. This included a temporary berm within a wetland area between the two aerial wye stub tracks. Description of this construction scenario was faxed to USFWS on December 13, 1995 with a request for guidance and comment. This construction scenario was also included, of course, in the Final BA.

   As PG&E has now completed a revised construction scenario for SFO-related activity, the December 13 proposal should be augmented to include work related to connecting a underground voltage feed to SFIA. Undergrounding of power feeds would be performed from east of Highway 101 and be extended under the freeway via a directional drill. This aspect of PG&E construction would include foot traffic and PG&E vehicles near wetland habitat for approximately one day. BART has assessed the impact of this activity to be not significant but has included a description in Attachment C for USFWS review.

In response to the comments of the USFWS, BART proposes an alternative to berming for temporary construction access. Construction activity for installation of the new PG&E towers would occur on either steel plates, interlocking grid plates or geotextile fabric that would reduce the effects of fill in wetlands and can be periodically removed from the habitat. BART will monitor the effectiveness of using these temporary structures in minimizing disturbances to the wetland habitat. BART would provide mitigation off-site for this construction access at a compensation ratio suggested by USFWS.

8. Development of Temporary All-Weather Access Roads in Habitat. Access roads are an element of the construction scenario which was also refined late in the project design process. The recent construction scenario for PG&E activity in the habitat requires reinforcement of some existing roadway. Also, a new connection from the west-of-Bayshore area to Highway 101 with all-weather surfacing is needed to haul materials to and from the laydown area.

In response to comments of the USFWS, the following provides a modification to the project description for access roads where temporary all-weather treatment would be necessary (maps of these roads provided in Attachment D). BART would provide mitigation on- or off-site for these roads at a compensation ratio suggested by USFWS.

Access Road for PG&E Tower Construction. In a method similar to that proposed for access for installation of PG&E towers, BART proposes to place steel plates, gravel on geotextile fabric or concrete block on approximately 900 feet of the existing dirt roadway in the habitat. Construction traffic on this roadway is expected to last for seven months and is expected to be initiated in the spring season. Truck traffic is not anticipated to be heavy during those seven months and therefore the habitat would not be significantly affected by this traffic. However, all-weather protection of the existing road would be applied after the first significant rainfall to protect from potential erosion caused by truck traffic on mud roads. In a seven month period, rain is likely to only occur for a few months and therefore all-weather surfacing would only be needed during that time. Since the all-weather surface would only be needed for a short period, the impact is considered to be temporary; mitigation for this impact is incorporated into the overall mitigation package described in Attachment E, Modification to Proposed Impact Assessment and Compensation.

Access Road for Laydown Area. The Final BA includes an extension of an existing road on the northern end of the west-of-Bayshore parcel. A temporary all-weather surface would be placed on a segment of an existing dirt access road north of Cupid Row Canal approximately 1600 feet long. For this distance, a 12-foot-wide dirt road would be expanded to 20 feet. The temporary road would consist of gravel on top of geotechnical fabric, placed on the existing dirt road. This action would require temporary cover for approximately 32,000 square feet or 0.74 acres of upland habitat. The gravel would be completely removed after construction on the west-of-Bayshore parcel is complete. The all-weather surface would be needed for the entire construction period and the impact will therefore be mitigated as a permanent impact to the habitat. Mitigation for this impact is incorporated into the overall mitigation package described in Attachment E, Modification to Proposed Impact Assessment and Compensation.

9. Modification to Proposed Impact Assessment and Compensation. The Final BA assessed temporary and permanent impacts to wetlands and uplands as they are standardly assessed for Section 404 Permit Applications: construction activity in habitat that would be removed or cease after the project was built would be considered a temporary impact and permanent impacts would be created by features of the completed project.

BART understands the actions to safeguard the habitat and compensate for potential habitat impacts in the Final BA included:

a. pre-construction site survey/monitoring during construction
b. exclusionary fencing/clearance and trapout of snakes
c. temporary construction trestle
d. 5 on-site habitat enhancements to west-of-Bayshore parcel
    1. study to characterize water regimes parcel
    2. alteration of culverts to seasonal wetland at southern end of parcel
    3. management/coordination of tidal gates at Cupid Row Canal
    4. bullfrog abatement program
    5. capture feeding program
e. option to provide off-site compensation if on-site enhancements not feasible
f. 3:1 compensation of wetland impacts (replacements proposed as part of the Section 404 Permit Application)
g. wetland creation west of the Caltrain track (as feasible)
h. restoration of habitat effected by project activities.

In response to the comments of the USFWS, Attachment E contains a supplement to the Final BA, including a revised assessment of potential impacts and a proposal for replacement and/or mitigation.

10. Revised Text in the Final BA. In response to the comments of USFWS, a revised project description to replace pages 4-22 in the Final BA is provided in Attachment F. This project description augments the text in the Final BA.

    In addition, the USFWS letter indicates that the final determination of adverse affect is the responsibility of the USFWS. BART had included a statement of determination as a conclusionary statement that sufficient mitigations would be proposed so that the proposed project would not result in an adverse effect and the continued existence of the SFGS would not be jeopardized.

BART and the FTA appreciate the opportunity to address USFWS concerns and understand that the consultation between BART and your agency has been highly productive. We would like to continue in that fashion and address the concerns your agency has with the project scenario and proposed mitigation. BART requests that you accept the clarifications and modifications provided in this letter as amendments to the Final BA. BART also requests that the USFWS continue the existing 90-day formal consultation period so that commitments made to other agencies with regard to the project schedule can be kept. In order to keep the existing schedule, BART would need a Biological Opinion by May 16, 1996.

As the FTA has authorized BART to act on the behalf of FTA on matters related to this letter, please feel free to contact me at (510) 287-4858 with any questions, concerns or responses to this letter. Thank you again for providing this opportunity to clarify and elaborate upon the Biological Assessment.

Sincerely,

Kathleen S. Pahl

Kathleen S. Pahl
SFO Planning Manager

cc:
Leslie Rogers, FTA, Regional Administrator
P. Takis Salpeas, BART, Executive Manager, West Bay Extensions
Michael Thabault, USFWS, Endangered Species
Jason Davis, USFWS, Ecological Services
Carl Wilcox, CDFG

ATTACHMENT A

SITE SELECTION OF WETLAND/UPLAND HABITAT COMPENSATION AREAS ADJACENT TO WEST-OF-BAYSHORE

Background on Selection of Site for Habitat Compensation

A number of sites for creation or enhancement of wetlands were considered to compensate for potential impacts created by the proposed BART-San Francisco Airport (BART-SFO) Extension Project. During informal consultation for the project, the US Fish and Wildlife Service (USFWS) had indicated that BART should include compensation for direct impacts to the San Francisco garter snake habitat in wetlands at a ration of 3:1. This compensatory property should be located at a site on or adjacent to the west-of-Bayshore parcel. In an effort to respond to this consultation, BART evaluated a number of potential mitigation sites on or adjacent to the west-of-Bayshore parcel.

With regard to development of wetlands on the west-of-Bayshore property, BART has not been able to come to an agreement with the property owner (San Francisco International Airport or SFIA) regarding creation of wetlands on-site that would not be considered actions that reduce the utility or developability of the property. Consequently, BART has determined that the creation or enhancement of wetland habitats on the west-of-Bayshore parcel to compensate for the loss of habitat sites elsewhere on the west-of-Bayshore parcel is not feasible.

BART identified three potential mitigation sites adjacent to the west-of-Bayshore parcel as potential habitat compensation areas (see Figure A-1):

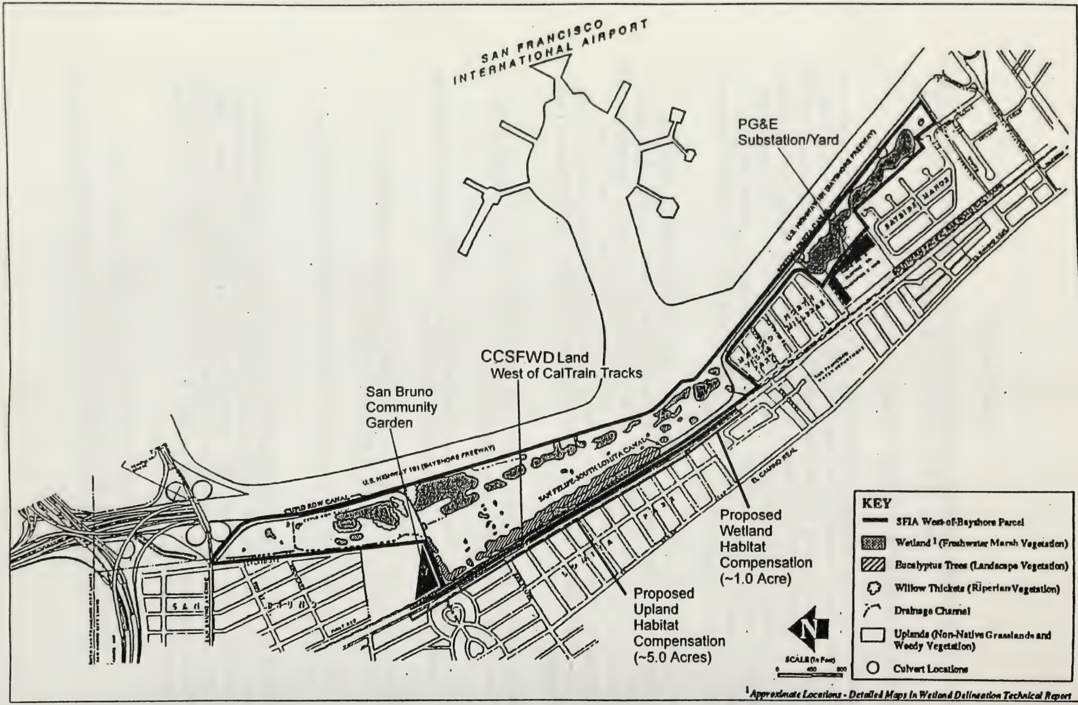
1) the 1.4 acre San Bruno community garden and the 4H club site located immediately north of Cupid Row Canal and east of 1st Avenue;

2) the upland area immediately east of the PG&E Substation between Santa Paula Avenue and Nadina Avenue in the City of Millbrae, and;

3) the undeveloped area between the CalTrain tracks and San Antonio/Huntington Avenue in San Bruno.

These sites were selected in an initial screening effort based upon two selection criteria; 1) presence of open, undeveloped areas in the immediate area of the west-of-Bayshore parcel, and 2) non-SFIA site ownership. BART conducted further analysis of these three potential mitigation sites, including a series of field reconnaissance surveys, to evaluate the feasibility of developing wetlands in each of these areas. A set of evaluation criteria were established and included the following:

- available acreage to meet the anticipated compensation ratio for impacts
- site ownership and future proposed uses of the site
- cost of mitigation, including purchase of property and wetland development costs


SAN FRANCISCO INTERNATIONAL AIRPORT
PG&E Substation/Yard
CCSFWD Land West of CalTrain Tracks
San Bruno Community Garden
Proposed Wetland Habitat Compensation (~1.0 Acre)
Proposed Upland Habitat Compensation (~5.0 Acres)
U.S. HIGHWAY 101 (BAYSHORE FREEWAY)
EL CAMINO REAL
BAYSIDE MANOR
N
SCALE (In Feet)
0
450
900
KEY
SFIA West-of-Bayshore Parcel
Wetland 1 (Freshwater Marsh Vegetation)
Eucalyptus Trees (Landscape Vegetation)
Willow Thickets (Riparian Vegetation)
Drainage Channel
Uplands (Non-Native Grasslands and Weedy Vegetation)
Culvert Locations

[1] *Approximate Locations - Detailed Maps In Wetland Delineation Technical Report*

OGDEN

Potential Compensation Sites In the Immediate Area of the West-of-Bayshore Parcel

FIGURE

A 1

- compatibility with adjacent land uses
- technical feasibility of creating wetland (hydrology, soils, biology)

SUMMARY

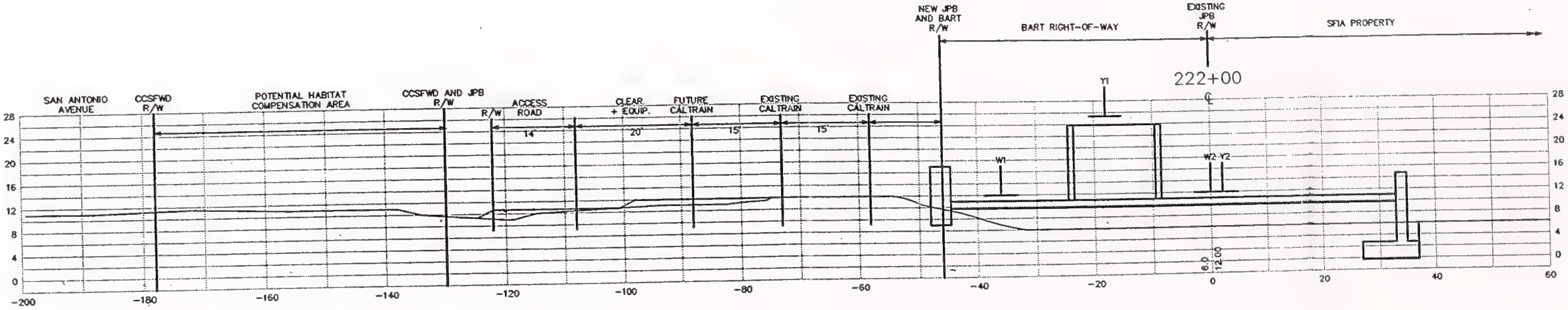
San Bruno Community Garden. This site is small and would only satisfy the 1:1 compensation ratio for the permanent loss of wetlands habitat. In order to function as a viable wetland, with connections to Cupid Row Canal, the site would require extensive excavation and removal of dirt which would make the creation of the wetlands on this site costly. In addition, the site would have to be purchased by BART form the city of San Bruno, which would also add to the cost of mitigating on this site. The City of San Bruno provided comments in the environmental process that reflected not being in favor of using this site as a wetland mitigation area. Comments included that development would conflict with the adjacent park and school land uses. In summary, this site was eliminated from further consideration because of its limited size and available mitigation potential, the high cost for the site in comparison to other sites and conflict with adjacent land uses and opposition by the City of San Bruno.

PG&E Substation. This potential mitigation site is owned by PG&E, is approximately 3.5 acres in size and consists of upland habitats located immediately east and north of the fenced PG&E Substation. The technical feasibility of this site as a wetland compensation area is in question due to a lack of a reliable water sources. The most likely wetlands that may be created on this site are seasonal wetlands. This site is currently upland habitat for the SFGS. The availability of this area is in question until PG&E has conducted a more detailed evaluation of their potential needs for this area for future expansion. If PG&E were to determine that a portion of this area were available to BART as a mitigation site, it would have to be purchased by BART, thus adding to the cost of the mitigation effort. The upland area would not be suitable as a wetland compensation site since it is currently functioning as upland habitat for the SFGS. However, there may be opportunities to enhance the upland habitat by planting coyote brush and building small earthen berms. This site appears large enough to provide compensation for the loss of permanent wetland, but appears too small to meet even a 1:1 ratio for upland compensation. In summary, this site was dropped from further consideration due to its questionable availability, limited size, and questionable technical feasibility.

West of the CalTrain Tracks. Land between the existing CalTrain tracks and Huntington/San Antonio Avenues has also been considered for habitat development. This strip of land is divided between two property owners. The land approximately 45 feet to the east and directly adjacent to the existing CalTrain tracks is owned y the Peninsula Corridor Joint Powers Board (JPB), which owns and operates the CalTrain system. The western parcel, next to Huntington/San Antonio Avenues is owned by the City and County of San Francisco Water Department (CCSFWD). This strip is also referred to as the old Muni railway corridor. This parcel ranges in width from approximately 30 feet at the northern end to approximately 50 feet at the southern. When BART first considered this site, it was believed that all of the area between the CalTrain tracks and the developed street would be available (approximately 12 acres). Subsequently the JPB indicated that space must be left for future

CalTrain development, but the right-of-way needs were not specified. Therefore wetland compensation on this site was included in the Final BA as "feasible". On March 4, 1996, the JPB confirmed that the area under new ownership would be required for development of future CalTrain facilities. Figure A-2 shows a cross section of the area between the proposed BART tracks and San Antonio Avenue that includes existing and proposed CalTrain development. This cross-section was developed based on the March 4 meeting with the JPB and concludes that the acreage available for wetland compensation west of the existing CalTrain track is equivalent to the property now owned by the CCSFWD.

The CCSFWD parcel provides some acreage and an adequate hydrological base to compensate for loss of wetland and upland habitat. Use of this site would require some extensive grading and protective measures but is considered feasible for wetland and upland habitat development. Such development would not be considered an incompatible land use, as the San Francisco garter snake and/or California red-legged frog have been located in the vicinity of this area and wetlands currently exist on the property.



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Typical Cross-Section West of Proposed BART Alignment

FIGUR

A 2

ATTACHMENT B

HABITAT RESTORATION GUIDELINES

Types and Locations of Wetland and Upland Habitats to be Restored

The areas to be restored under this project include all wetland and upland habitats where project impacts will cease or be removed after the construction is completed.

Wetlands to Be Restored

Wetland habitat types which will be temporarily impacted and restored include vegetated ditches, swales, canals, and seasonal wetlands. The location of each wetland habitat type is listed below. Acreage calculations for each wetland habitat site to be disturbed are identified in Appendix F. The following identifies the types and locations of areas to be restored after project construction is complete.

1. Vegetated ditches, swales, and creeks

   The total acreage of ditches, swales, and canals to be restored is approximately 0.37 acre. Individual sites are as follows:

   a. Western portion of Cupid Row Canal for approximately 240 linear feet downstream of Huntington Avenue (relocation northward to resolve conflict with subway box)
   b. San Felipe Canal (BART at-grade track construction)
   c. South Lomita Canal (southern aerial wye construction)
   d. Drainage ditch south of main tributary to South Lomita Canal, east of Caltrain (BART at-grade construction)

2. Seasonal wetlands

   a. Herbaceous cover

      The total acreage of herbaceous seasonal wetlands to be restored is approximately 0.58 acre. Individual sites are as follows:

      1. Two isolated seasonal wetlands, south of Cupid Row Canal (contractors' laydown area)

      2. Seasonal wetland pond adjacent to Highway 101 (northern aerial wye and PG&E tower construction)

b. Mixed herbaceous and willow thicket

The total acreage of seasonal wetlands with mixed herbaceous and willow thicket cover to be restored is approximately 0.34 acre. One such site has been identified:

1. Seasonal wetland pond, with willows, adjacent to Highway 101 (temporary access road)

Uplands to Be Restored

A linear strip of upland in the western portion of the west-of-Bayshore parcel will be temporarily impacted and restored by the proposed project. The northern portion of this linear area is currently dominated by Eucalyptus trees, while the southern portion is covered by scrub species, including blackberry and willow thickets. Construction of the aerial wye trackway footings will temporarily disturb some upland area dominated by both Eucalyptus trees and annual grasses. The actual acreage of temporary disturbance to upland areas will range between 5.2 acres to 7.03 acres, depending on the extent of disturbance associated with construction of and use of the construction trestle.

Eucalyptus trees will be removed during construction. Restoration of this upland area will include the planting of coyote bush *(Baccharis pilularis)* from nursery stock and seeded with ryegrass *(Lolium sp.)* In addition, supplemental San Francisco garter snake hibernacula may be created within the upland sites that are to be restored. These supplemental hibernacula would consist of berms of soil that would also be planted with coyote brush from nursery stock and seeded with ryegrass. These plantings may require irrigation for the first two years after planting, as determined by the restoration biologist.

Areas currently inhabited by blackberry and willow thickets will be regraded after construction to restore the original the original contour and elevation of the area. These species will be allowed to naturally reestablish themselves. Measures will be taken to prevent other noxious weedy species from invading these areas, as will be described in the specific restoration plan for these sites.

Restoration Guidelines for Pre-Construction Activities

Prior to construction, specific activities will be conducted at each restoration site in order to provide data for future restoration goals and to minimize the impacts of construction on the habitats. General guidelines are provided for all sites, while specific guidelines are provided for sites which will be temporarily covered by fill or temporarily excavated.

In all cases, sites will require plant, soil and hydrological inventories prior to project disturbance. These inventories will be prepared by a biologist and will include preparation of detailed plant lists, documented with pertinent ground photos.

ATTACHMENT C

DESCRIPTION OF PROPOSED NEW LOCATION FOR HIGHWAY 101 CROSSING FOR 12 kV FEED TO SFIA

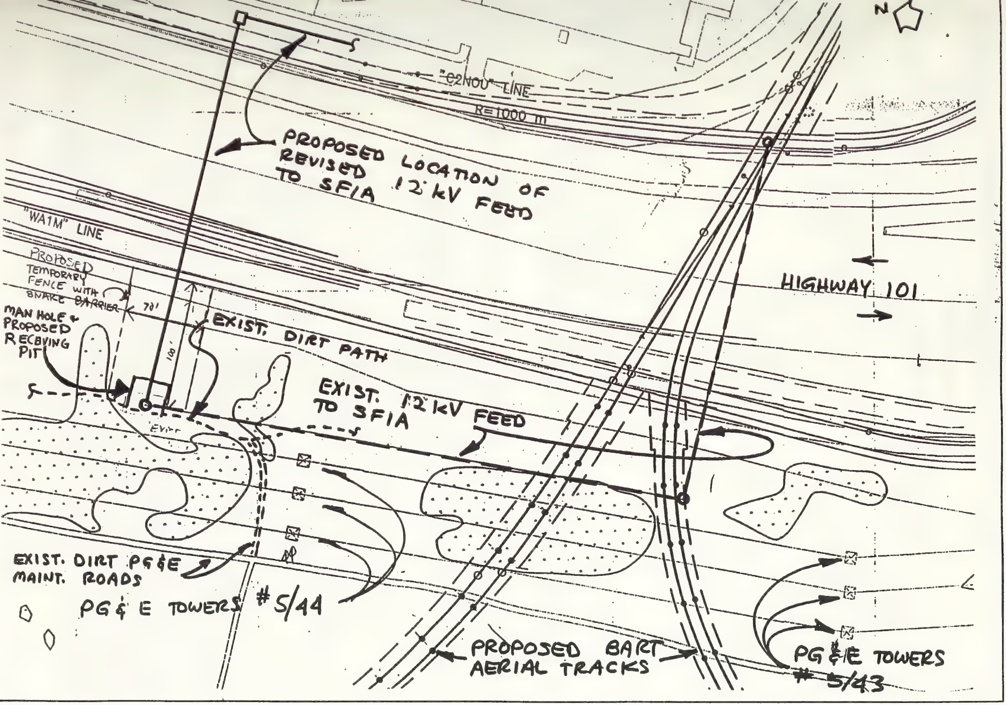
An existing 12 kV underground power feed from the west side of Highway 101 to the San Francisco International Airport (SFIA) is being impacted by the footings for the BART aerial structures crossing Highway 101. The SFIA operations staff has requested that BART relocate the Highway 101 crossing for this power line to a point some few hundred feet northerly of the existing crossing.

The underground line west of Highway 101 is routed between manholes spaces approximately 750 feet apart, just prior to turning east and passing under Highway 101. A new Highway 101 crossing is proposed to be constructed between an existing manhole on the west side and a new man hole located on SFIA property adjacent to McDonnell Road. The Highway 101 crossing would be constructed by building a rectangular boring pit on the easterly side of Highway 101 in SFIA property. A new underground crossing would be installed under Highway 101 by directional drilling from the pit to the existing manhole located on the westerly side of the highway. New conduit would be installed between the pit and the existing manhole from the pit. New cables would be pulled from the existing manhole to the pit.

It is now estimated that the installation of the new cables between the existing manhole and the pit would require the presence of a truck carrying the reels of cable to be pulled through the manhole to the pit. This truck would have to travel over existing dirt PG&E maintenance roads and a dirt path to a point where the cables could be fed from the back of the truck to the existing manhole. The truck would be located in the vicinity of PG&E transmission towers No 5/44, approximately 350-400 feet southerly of the existing manhole. Temporary cable trays or roller stands would have to be located along an existing dirt path to support the cables between the truck and the existing manhole.

A crew of electricians would be required to make the connecting splice between the existing 12kV underground power feed cables and the new cables at the existing manhole. New trenching, conduit and cables would be extended into SFIA from a new manhole constructed in the pit and tied to the existing 12kV underground powerfeed southerly of the pit and easterly of Highway 101. The cable pulling operation would require a 70' by 100' construction area. This area would be staged east of an existing wetland in an upland area. The construction area would be cleared and fenced per procedures discussed in the Final BA, including use of exclusionary fencing weeks prior to construction begins. No vehicular traffic would be allowed beyond the limits of existing dirt roads used by PG&E for maintenance of their transmission lines in the area west of Highway 101. Figures C-1 and C-2 illustrate the location of proposed construction, vehicle roads, and snake fencing for work on the 12kV feed in relation to existing wetlands/habitat.

Mitigation for this activity would be performed as part of the on- and off-site proposals identified in Attachment E.



N
"C2NOU" LINE
R=1000 m
PROPOSED LOCATION OF REVISED 12 kV FEED TO SFIA
"WA1M" LINE
PROPOSED TEMPORARY FENCE WITH SNAKE BARRIER
70'
100'
MAN HOLE & PROPOSED RECEIVING PIT
EXIST. DIRT PATH
EXIST. 12 kV FEED TO SFIA
HIGHWAY 101
EXIST. DIRT PG&E MAINT. ROADS
PG&E TOWERS #5/44
PROPOSED BART AERIAL TRACKS
PG&E TOWERS #5/43

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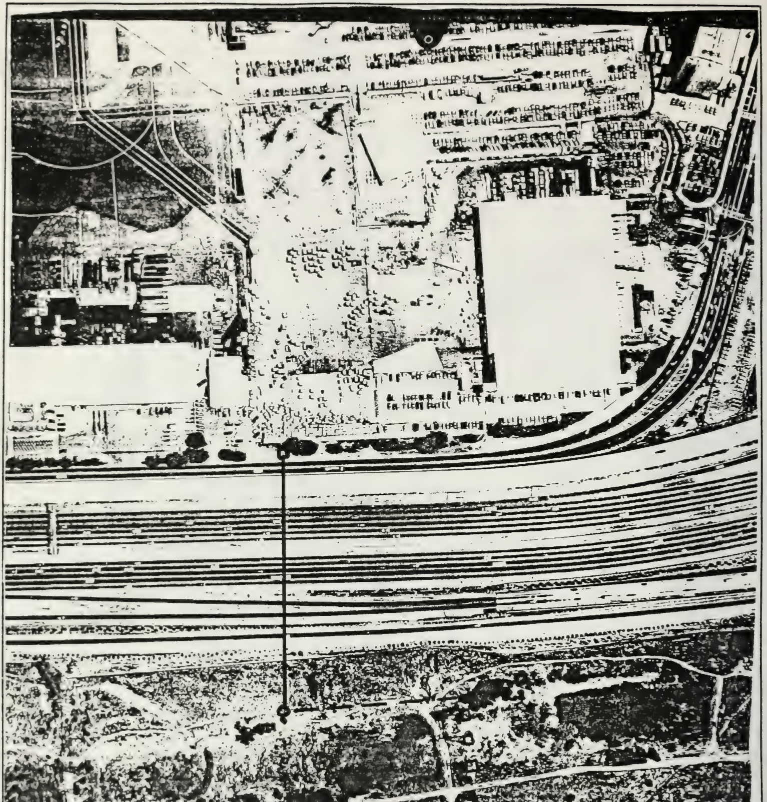
Illustration of Proposed Construction Scenario for 12kV Feed

FIGURE

C-1



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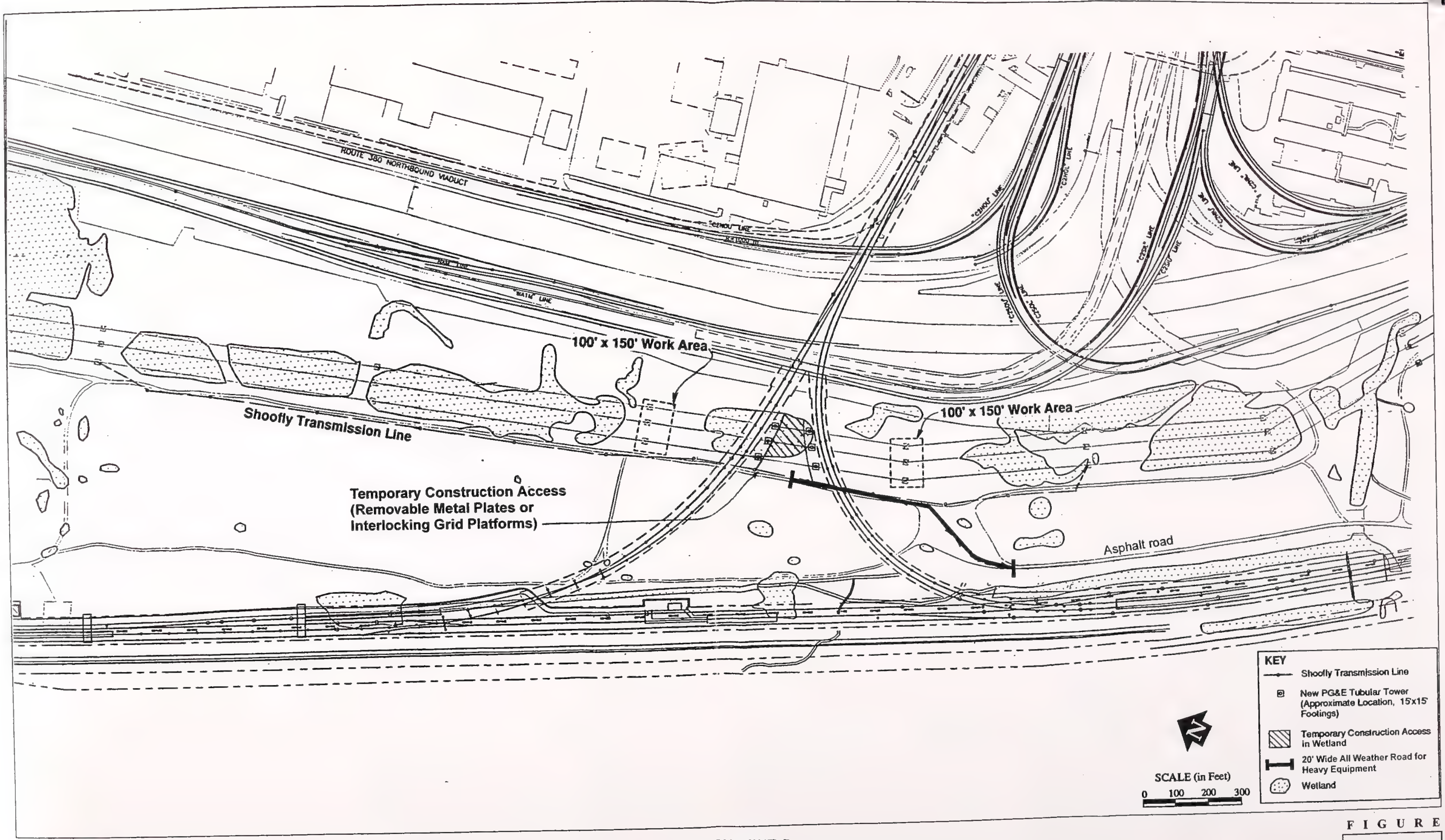
Aerial Photograph with Location of Proposed 12kV Feed

FIGURE

C-2


ROUTE 380 NORTHBOUND VIADUCT
MAIN LINE
"MAIN" LINE
100' x 150' Work Area
100' x 150' Work Area
Shoofly Transmission Line
Temporary Construction Access
(Removable Metal Plates or
Interlocking Grid Platforms)
Asphalt road
KEY
Shoofly Transmission Line
New PG&E Tubular Tower (Approximate Location, 15'x15' Footings)
Temporary Construction Access in Wetland
20' Wide All Weather Road for Heavy Equipment
Wetland
N
SCALE (in Feet)
0
100
200
300

ATTACHMENT D

Proposed PG&E Construction Access

FIGURE

D-1

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ATTACHMENT E

ASSESSMENT OF POTENTIAL PROJECT IMPACT AND COMPENSATION

Assessment of Potential Project Impact

Potential impacts to San Francisco Garter Snake (SFGS) habitat have been reevaluated based on consultation with the USFWS in March 1996. Criteria to assess impacts are as follows:

> Temporary Impacts
> Construction related disturbances of short duration (6 months or less) upon wetland habitat and upland habitat that does not support SFGS hibernacula (as indicated by burrows and/or coyote bush).
>
> Permanent Impacts
> Impacts associated with the displacement of SFGS habitat by proposed project features and construction-related disturbance of a long duration (greater than one reproductive cycle of the SFGS or 6 months to a year) to wetlands and/or uplands that do support SFGS hibernacula.

These defintions of permanent and temporary impacts differ from those originally proposed in the Section 404 permit application and the Final BA, as recommended by USFWS.

Based on the revised project description provided in the BART response to the USFWS letter of February 23, 1996 and the criteria for impact assessment listed above, BART has calculated the amount of permanent and temporary impact to SFGS habitat.

The total amount of temporary impacts in the wetland habitat has been calculated to be approximately 0.34 acres and permanent impacts in wetland habitat approximately 1.61 acres. The total amount of wetland impact in habitat is 1.96. Table E-1 at the end of this attachment provides a list of wetland areas by size and location that are impacted by project features.

In order to provide an opportunity to make some comparisons among this table and previous environmental documents that analyze project impacts to wetlands, some sites are highlighted in bold or italics. Sites are identified in bold when they have been been newly identified as impact areas after recent project refinement. Note that due to project refinements, some potential impacts listed in previous environmental documents have been reduced (e.g. the carwash has been removed from the habitat, soundwalls no longer transect wetlands).

The table references the wetland sites in habitat that were included in the Section 404 permit application by drawing number. These sites are also identified in bold when they differ from information identified in the Section 404 Permit application as a result of discussions with USFWS. For instance, when construction is proposed to transect a wetland, the portion of the wetland not directly impacted by adjacent construction is treated as a temporary impact (such as indicated for Impact # 4 on the table). This type of classification of wetland impact is typically not considered in Section 404 permits. Sites estimated as temporary/permanent habitat impacts that have been calculated differently from the temporary/permanent impacts in the Section 404 permit application are highlighted in italics.

Impact assessment for uplands assumes that all of the west-of-Bayshore parcel is hibernacula for the SFGS; all of the parcel which is not considered wetland is considered upland. Under that assumption, the impacts to the upland habitats associated with temporary project construction activities would amount to approximately 1.15 acres. The amount of SFGS upland habitat that would be considered longer term or permanently displaced by the proposed project has been calculated to be approximately 7.96 to 9.39 acres. The range of impact assumes the minimum points where pilings in aerial structures touch the ground versus the maximum area which could be considered effected (drip line or shadow line of the aerial structure). The total area of SFGS upland habitat that would be displaced and/or disturbed by the proposed project, both by construction and permanent activity, ranges from approximately to 9.11 to 10.54 acres. Table E-2 at the end of this attachment provides a list of project features and the amount of estimated potential impact upland areas.

Prior to the initiation of project construction on the west-of-Bayshore parcel, BART will conduct a preconstruction field survey to define SFGS hibernacula areas and thus further refine temporary and permanent impacts to uplands.

Proposed Compensation

BART is augmenting the mitigation proposal presented in the January 1996 Biological Assessment (Final BA), to include the following proposal. Mitigation of impacts will be based on the approach listed below; a detailed mitigation proposal, including replacement/compensation acreages will be specified in a Final Compensation Plan, to be prepared and implemented after approval of the project (see below).

Replacement/Compensation Proposal

Both replacement of habitat and compensation for project impacts to habitat are proposed as mitigation for the project. For the purposes of this proposal, habitat replacement includes enhancement and development of new wetland/upland habitat which would occur adjacent to the west-of-Bayshore habitat (referred to as "on-site") and thus directly support that population of SFGS. Habitat compensation is defined as securing and preserving existing SFGS wetland/upland habitat away from the west-of-Bayshore habitat (referred to as "off-site"). Where compensation is proposed, creation of additional wetlands to augment those existing at the off-site location is not proposed. Property which could be utilized by the SFGS as upland habitat would be enhanced.

BART proposes to replace habitat adjacent to the west-of-Bayshore as feasible and augment replacement with off-site habitat compensation.

For wetland impacts considered permanent, mitigation performed as on-site replacement would occur at a 3:1 ratio of replacement to impact; mitigation performed as off-site compensation would occur at a 5:1 ratio of compensation to impact.

For wetland impacts considered temporary, mitigation performed as on-site replacement would occur at a 2:1 ratio of replacement to impact; mitigation performed as off-site compensation would occur at a 3:1 ratio of compensation to impact.

Upland habitat will be compensated for at a ratio based on the existing habitat ratio of upland to wetland on the west-of-Bayshore parcel. BART has calculated this ratio to be three acres of upland for every one acre of wetland. Therefore, for every acre of wetland created or compensated for by BART as project mitigation, another three acres of upland would be provided at the selected mitigation site. This would establish replacement or compensation for the upland that supports the species in a setting similar to the existing habitat.

Based on a) the 1.96 acre impact shown in Table E-1 and b) calculations using the ratios identified above, BART would provide replacement and compensation wetlands. An initial estimate of the replacement and compensation wetland is approximately 5 to 10 acres; the amount will be refined in the Final Compensation Plan after determining the amount of wetlands that can be created on-site. Subsequently, the amount of enhancement or compensation proposed for upland habitat would be established at a 3:1 ratio of upland to wetlands created/enhanced. Based on the identified ratios, preliminary estimates of upland compensation or enhancement is 15 to 30 acres.

Proposal for Wetland and Upland Mitigation Adjacent to the West of Bayshore Parcel

Creation of approximately one and a half acres of wetland is proposed for an area adjacent to the west-of-Bayshore parcel in the cities of San Bruno and Millbrae. This wetland area would be developed from an approximate 5 to 6 acre strip of land extending south from the existing San Bruno Caltrain Station to just north of Center Street. It is bordered to the east by right-of-way for the Caltrain system and to the west by Huntington /San Antonio Avenues. The property is approximately 90 feet from the west-of-Bayshore habitat. No other potential sites adjacent to the west-of-Bayshore habitat have been found feasible for wetland development.

BART has identified one location within the 5- to 6-acre strip as feasible for wetland development. It is approximately 50' feet wide and approximately 1000 feet long in the vicinity of Santa Helena and San Antonio Avenues. This area could sustain approximately 1 acre of wetland habitat. See Figure E-1 for a conceptual drawing of the proposed wetland development site. Water would flow through the wetland site and be fed by South Lomita Canal. Other potential wetland development locations could include small ponding within the 5- to 6- acre strip as feasible. Another option could include pumping water onto this site from another source. The remainder of this strip could be enhanced and established as upland habitat for the SFGS, with removal of some adjacent trees and planting of appropriate vegetation. Upland areas would be interspersed in the wetland development.

Fencing and/or other appropriate barriers would surround the mitigation area to prevent SFGS access to adjacent residential activities. SFGS access to the larger habitat on the west-of-Bayshore parcel would be provided through existing drainage culverts and some additional access "tunnels" in upland areas as well.

Proposal for Off-Site Habitat Compensation

For impacts which cannot be compensated for by replacement habitat adjacent to the west-of-Bayshore parcel, BART proposes to secure existing SFGS habitat and provide an endowment for the future maintenance of this habitat in perpetuity. This proposal is similar to the Steel Ranch proposal provided in the Final BA as an option.

This property purchased or deeded for compensation would include upland and wetland habitat and would exist as a protected habitat. BART would identify an agency or other entity to maintain the property, using the interest from the endowment. Existing habitat identified thus far includes Steel Ranch, located adjacent to Ano Nuevo State Park in southern San Mateo County. For this or another property, BART would define compensation as the preservation of the existing habitat and does not anticipate creation of new upland or wetland for off-site compensation. BART anticipates securing an endowment to provide for an approximate $50,000 fund for maintenance per year.

Proposal for Finalization of Compensation Plan

Subsequent to Section 7 approvals by the USFWS and prior to construction, BART will perform a preconstruction survey to finalize acreages estimated to be impacted by the project. At this time BART will prepare the mitigation plan/feasibility study for wetland/upland creation adjacent to the west-of-Bayshore parcel. Hydrology, phasing of adjacent project construction, protection of adjacent land uses, water sources and other issues related to development of the habitat will be examined at that time. Best efforts will be made to develop the maximum amount of viable habitat for the SFGS within the property boundaries. This mitigation/feasibility study will be performed so that the remaining amount of mitigation needed to be obtained off-site can be determined. A property for off-site habitat compensation would be obtained within a year of issuance of the Biological Opinion from the USFWS.

TABLE E-1

ESTIMATED AREA OF POTENTIAL IMPACTS TO WETLANDS ON AND IN THE IMMEDIATE VICINITY OF THE WEST-OF-BAYSHORE PARCEL

Impacted Site[1]	Area of Impact (Acres)	Duration of Impact
Temporarily Impacted Sites:		
1. West End of Cupid Row Canal (Site 2-3a Drawing 10 and Sheet 40)	0.06	One Dry Season (apprx. 6 months)
2. North Tributary to Cupid Row Canal (Site 2-3b Drawing 10 and Sheet 41)	0.05	One Dry Season (apprx. 6 months)
3. Aerial Wye Footings from Northern Wye Stub (Site 2-6a drawing 14 and Sheet 65)[2]	**0.013**	**One Dry Season (apprx. 6 months)**
4. Isolation of Northern Portion of Seasonal Wetland Beneath the Northern Leg of the Aerial Wye Stub. (Site 2-8 Drawing 16 and Sheet 61)[2]	**0.16**	**Entire construction period (approx. 2 years) but no direct impacts**
5. Southern End of San Felipe Canal for Southern Aerial Wye Stub Footings (Site 2-9 Drawing 17 and Sheet 55)	0.03	Less than 6-7 months
6. Madrone Street Ditch Re-alignment (Site 2-10d Drawing 19 Sheet 48)	0.03	Constructed before Project Construction
TOTAL AREA OF WETLANDS TEMPORARILY IMPACTED:	0.343	

TABLE E-1

ESTIMATED AREA OF POTENTIAL IMPACTS TO WETLANDS ON AND IN THE IMMEDIATE VICINITY OF THE WEST-OF-BAYSHORE PARCEL

Impacted Site[1]	Area of Impact (Acres)	Duration of Impact
Permanently Impacted Sites:		
7. Northern Tributary to Cupid Row Canal (reach between existing Cupid Row Canal alignment and new proposed alignment) (Site 2-3b Drawing 10 Sheet 40)	0.01	NA
8. Construction Laydown Area Access Road (Site 2-3c Drawing 11 and Sheet 43A) [3]	*0.09*	*Entire Construction Period (2 years)*
9. Seasonal Wetlands within the Proposed Construction Laydown Area (Site 2-3d Drawing 11 and Sheet 43A) [4]	*0.04*	*Entire Construction Period (2 years)*
10. Drainage Ditch East of San Felipe Ave. and East of CalTrain Tracks to Edge of SFIA West-of-Bayshore Parcel (Site 2-4c Drawing 12 Sheet 73)[4]	**0.003**	**NA**
11. West End of San Felipe Canal West of CalTrain Tracks (Site 2-5b Drawing 13 Sheet 72)[4]	0.04	NA
12. Northern Seasonal Wetland along San Felipe Canal West of CalTrain tracks (Site 2-5c Drawing 13 Sheet 72)	0.29	NA
13. Southern Portion of Seasonal Wetland Underneath and between the Aerial Wye Stub Legs. (Site 2-8 Drawing 16 Sheet 61)[2]	**0.86**	**Area impacts over the entire construction period (approx. 2 years)**

TABLE E-1

ESTIMATED AREA OF POTENTIAL IMPACTS TO WETLANDS ON AND IN THE IMMEDIATE VICINITY OF THE WEST-OF-BAYSHORE PARCEL

Impacted Site[1]	Area of Impact (Acres)	Duration of Impact
14. Northern Aerial Wye Stub Columns in San Felipe Canal (Site 2-6a)[2]	**0.002**	**NA**
15. Shallow Depression Wetland on West-of-Bayshore Parcel in Footing for Northern Aerial Wye Stub and Beneath the Trestle (Site 2-6b Drawing 14 Sheet 65) [3]	*0.02*	*Area impacts over the entire construction period (approx. 2 years)*
16. Southern Seasonal Wetland on San Felipe Canal between Aerial Wye Stub Legs (Site 2-7a Drawing 15 Sheet 64)	**0.12**	**NA**
17. Narrow Drainage just South of Site 2-7a (Site 2-7b Drawing 15 Sheet 64)	**0.003**	**NA**
18. Tributary Channel into South Lomita Canal West of the CalTrain Tracks (Site 2-10b Drawing 18 Sheet 47)	0.02	NA
19. Construction of Mainline Tracks with 10-foot-wide Construction Zone [2]	***0.1***	***Entire Construction Period (2 years)***
20. Seasonal Wetland West of the CalTrain Tracks just North of the Tributary to South Lomita Canal (Site 2-10c Drawing 18 Sheet 47)	0.02	NA
TOTAL AREA OF WETLANDS PERMANENTLY IMPACTED:	**1.618**	
TOTAL WETLANDS IMPACTED:	**1.961**	

TABLE E-1

ESTIMATED AREA OF POTENTIAL IMPACTS TO WETLANDS ON AND IN THE IMMEDIATE VICINITY OF THE WEST-OF-BAYSHORE PARCEL

[1] Impact sites are identified by the site identification number and the drawing in Appendix A of the Section 404 Mitigation and Restoration Proposal and the sheet number in the 404 application

[2] Rows in bold represent sites that have changed in definition or differ from the information presented in the 404 application due to a) refinements in project design or b) differing methodology for defining impacts to wetlands that also serve as habitat

[3] Rows in italics represent impacted areas that were originally classified as temporary but have been reclassified as permanent.

TABLE E-2

ESTIMATED AREA OF IMPACTS TO UPLANDS ON THE WEST OF BAYSHORE PARCEL

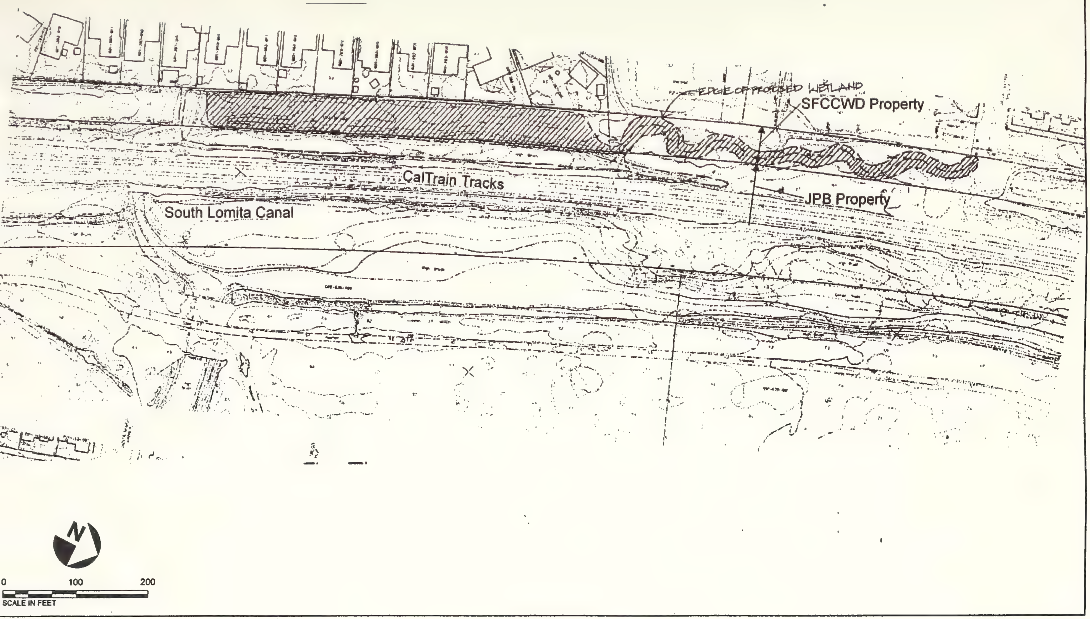
Impacted Site	Area of Impact (Acres)	Duration of Impact
Temporarily Impacted Sites:		
1. Footings for PG&E Towers	0.05	6-7 months
2. Improved Access Road to PG&E Construction Site	0.41	1 to 2 months
3. PG&E Modification to Existing Towers	0.69	6-7 months
TOTAL AREA OF UPLANDS TEMPORARILY IMPACTED:	1.15	
Permanently Impacted Sites: [1]		
1. Construction of Mainline with 10-foot-wide Construction Zone	*1*	*Entire Construction Period (2 years)*
2. Aerial Wye Footings	*0.68*	*One Year (apprx. 12 months)*
3. Temporary Trestle for Aerial Wye Stub	*0.27 to 1.7* [2]	*One Year (apprx. 12 months)*
4. Construction Laydown Area	*2.96*	*Entire Construction Period (2 years)*
5. Temporary Access Road to Construction Laydown Area	*0.87*	*Entire Construction Period (2 years)*

TABLE E-2
(continued)

Impacted Site	Area of Impact (Acres)	Duration of Impact
6. SFIA West of Bayshore Property Consisting of Upland Habitats that Would Be Displaced by Proposed Project Features	2.14	NA
7. New PG&E Tubular Towers in Upland West of Highway 101	0.01	NA
8. BART Aerial Wye Columns	0.03	NA
TOTAL AREA OF UPLANDS PERMANENTLY IMPACTED:	**7.96 to 9.39**	
TOTAL AREA OF IMPACTED UPLANDS:	**9.11 to 10.54**	

1 Rows in *Italics* represent impacted areas reclassified from temporary to permanent.

2 The low value was calculated using only the area where pilings touch the ground; the high value was calculated using the area of the entire shadow of the trestle.



OGDEN

Conceptual Design of Wetland Habitat
on SFCCWD Land West of Caltrain Tracks

FIGURE

E-1

ATTACHMENT F

REVISED PROJECT DESCRIPTION

1. INTRODUCTION

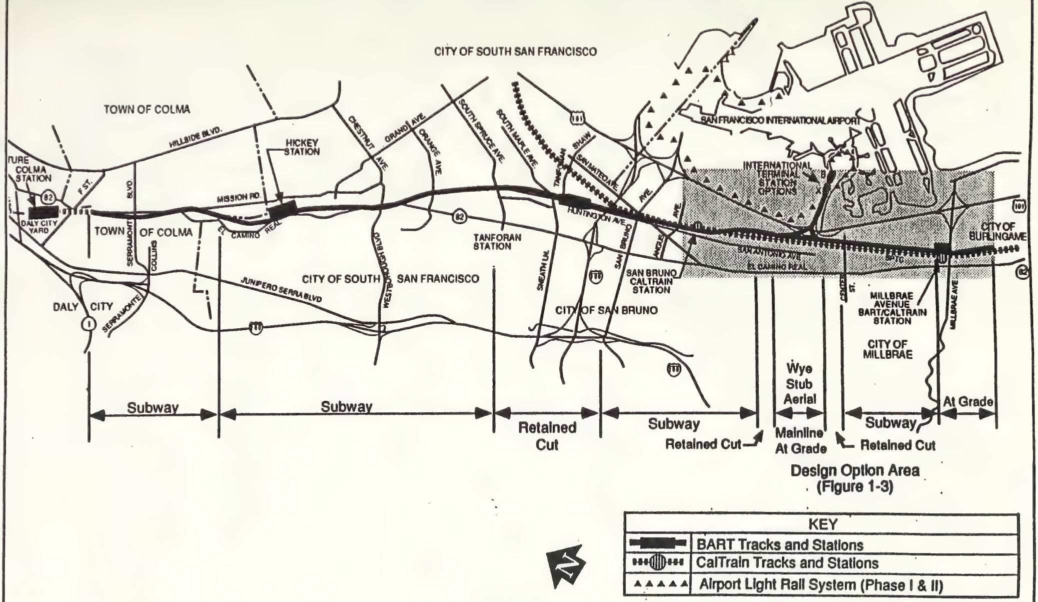
This Biological Assessment (BA) has been prepared for the proposed San Francisco Bay Area Rapid Transit District (BART) Extension to the San Francisco International Airport (SFIA). BART was given the responsibility of meeting Federal Transit Administration [FTA] the federal lead agency responsible for the project) requirements in the formal Section 7 consultation process in a letter dated January 27, 1995. The proposed Project (hereinafter referred to as the BART Extension) extends from the existing Colma Station to the SFIA. This document addresses the Alternative VI Aerial Design Option to the SFIA. (As this design option is the Locally Preferred Alternative, it is subject to possible selection as the Project by the BART and San Mateo County Transit District [SamTrans] boards and approval by FTA with certification of the FEIR/FEIS.) This BA is being submitted prior to selection of the Project to meet the NEPA/404 MOU, which requests that preliminary agreement on mitigation for endangered species be included in the FEIS. If the Locally Preferred Alternative, which is reflected herein, is not selected and approved as the Project, the requisite documentation to update this BA would be submitted to the U.S. Fish and Wildlife Service (USFWS).

The purpose of this BA is to evaluate and document potential impacts of the BART Extension on Federally listed endangered and/or threatened species; species which are candidates for listing as endangered or threatened, and any critical habitat listed by the USFWS under the Federal Endangered Species Act (FESA) that occurs within the BART Extension project corridor. For purposes of description and analysis, the "project corridor" encompasses all lands generally within one quarter mile of the proposed BART Extension alignment. This Biological Assessment meets the requirements of Section 7 of the FESA (19 USC 1536 [c], 50 CFR 402.12 [f] and 402.14 [c]).

The project corridor is located in northern San Mateo County and extends nearly eight miles from the southern terminus of the existing BART tracks in an unincorporated area of the Town of Colma. The corridor extends south through the Town of Colma and the cities of South San Francisco, San Bruno, a small portion of unincorporated San Mateo County owned by SFIA, the City of Millbrae, and the northern portion of the City of Burlingame (Figure 1-1).

Although the project corridor is approximately eight miles long, there is only one portion of the corridor that supports wildlife species that are under the jurisdiction of the FESA. This is the 180 acre parcel of land immediately west of the Bayshore Freeway, or Highway 101, that is owned by the SFIA (hereinafter referred to as the "west-of-Bayshore parcel") as depicted in Figure 1-2. This parcel of land supports the endangered San Francisco garter snake *(Thamnophis sirtalis tetrataenia)*, the California red-legged frog (*Rana aurora draytonii*) which is proposed for listing as endangered under the FESA (Federal Register, 1994), and the San Francisco forktail damselfly (*Ischnura gemina*) which is a candidate for listing as endangered or threatened under the FESA. There are no endangered, threatened or candidate plant species, or designated critical habitats identified within the project corridor.

There have been a number of environmental studies conducted and documents prepared in support of the proposed BART extension project. Those studies and reports most applicable to the information provided in this BA include the following:



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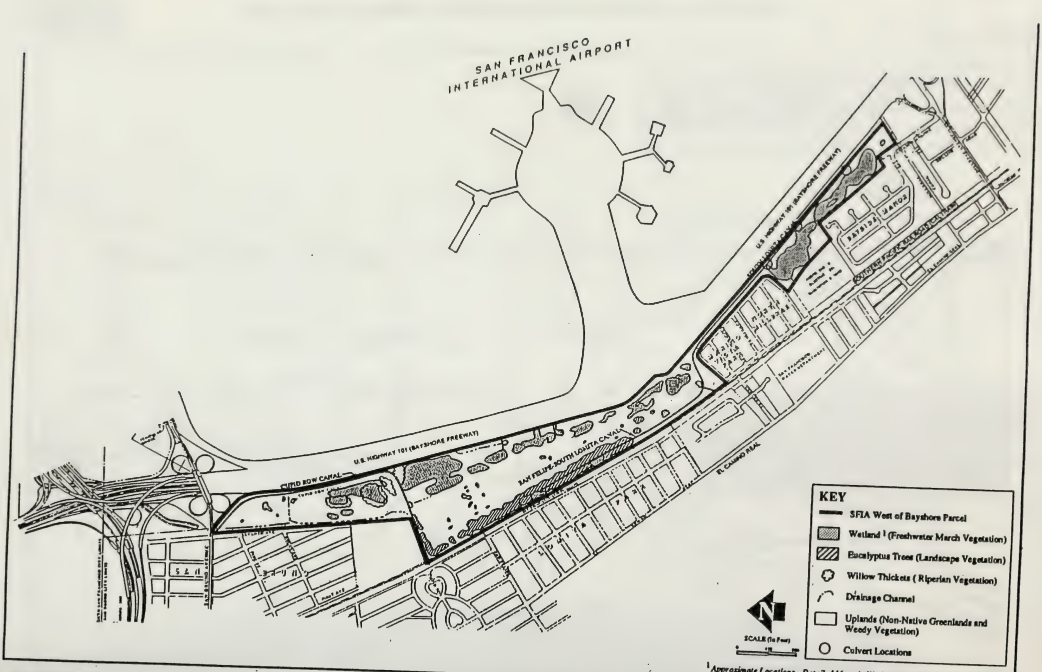
Alternative VI Project Corridor with Aerial Design Option Area

FIGURE 1-1


SAN FRANCISCO INTERNATIONAL AIRPORT
U.S. HIGHWAY 101 (BAYSHORE FREEWAY)
CUPID ROW CANAL
SAN FELIPE-SOUTH LOMITA CANAL
SOUTH LOMITA CANAL
BAYSIDE MANOR
SOUTHERN PACIFIC RAILROAD
EL CAMINO REAL
N
SCALE (In Feet)
KEY
SFIA West of Bayshore Parcel
Wetland 1 (Freshwater March Vegetation)
Eucalyptus Trees (Landscape Vegetation)
Willow Thickets (Riperian Vegetation)
Drainage Channel
Uplands (Non-Native Greenlands and Weedy Vegetation)
Culvert Locations

[1] Approximate Locations - Detailed Maps in Wetland Delineation Technical Report

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Vegetation Communities and Wildlife Habitats on West-of-Bayshore Parcel

FIGURE

- An Alternatives Analysis/Draft Environmental Impact Statement/Draft Environmental Impact Report (AA/DEIS/DEIR) report was completed in March of 1992. The AA/DEIS/DEIR presented a screening and refinement of a number of project alternatives and documented the environmental consequences of each alternative. From this report, BART, San Mateo County Transit District (SamTrans), and the Metropolitan Transportation Commission (MTC) selected the BART to Airport External via I-380 Alternative as the "Locally Preferred Alternative" in the spring of 1992. This LPA included an external BART/CalTrain/Airport Light Rail Station on the west of Bayshore property with new freeway northbound and southbound on and off ramps.

- A new DEIR and a Supplemental Draft EIS (SDEIS) was released in January 1995 by BART, SamTrans and the Federal Transit Authority (FTA) in response to technical issues raised in the review of the AA/DEIS/DEIR, and to a number of newly identified alternatives that were not analyzed in the AA/DEIS/DEIR. The DEIR/SDEIS contains an analysis of the environmental consequences for each alternative as well as appended technical reports on the three sensitive species addressed in this Biological Assessment.

  The California Department of Fish and Game (CDFG) commented on the DEIR/SDEIS that alternatives that have an intermodal transit station west of Highway 101 (the 1992 LPA and its Least Cost I-380 Design Option, the TSM and the Base Case) would probably result in loss and disruption to prime habitat for the San Francisco Garter Snake, an endangered species.

  Based on public comment and considerations of ridership, service to the SFIA, the CDFG comment and other environmental impacts, the BART and SamTrans Boards on April 27 and 28, 1995 selected Alternative VI-BART to Millbrae via a tunnel alignment to the planned Airport International Terminal as the new LPA. The estimated capital cost of Alternative VI was $1.269 billion ($1996).

- A Focused Recirculated Draft Environmental Impact Report/Supplement #2 Draft Environmental Impact Statement (FRDEIR/S#2DEIS) was prepared and released in September 1995 to consider aerial options of bringing BART service into SFIA. The FRDEIR/S#2DEIS specifically accomplishes the following purposes:

  1) Addressed the directive from the U.S. Congress House of Representatives Appropriations Committee to consider less expensive design options into the San Francisco International Airport (SFIA);

  2) Addressed the MTC Resolution No. 2451 which supported BART's preliminary engineering grant application to the FTA conditioned partially on the understanding that BART will identify and implement feasible cost containment strategies for the BART-SFO Extension;

  3) Addressed the BART Board of Directors September 12, 1995 Resolution and the San Francisco Airports Commission September 19, 1995 Resolution to adopt passenger service quality standards for a BART station in the San Francisco International Airport. The Aerial Design Option best satisfies these standards. The reader should refer to the *BART - San Francisco Airport Extension Locally Preferred Alternative Report*, December, 1995 for more details; and

4) Addressed hazardous materials risk concerns for the tunnel alignment into the Airport. Although hazardous materials were known to exist on the Airport property east of Highway 101, the extent of contamination was unknown for the tunnel alignment and cut and cover subway station under Alternative VI. This represented a significant cost and time risk to BART. Because hazardous materials information is documented for the proposed location of the Aerial Design Option east of Highway 101, the extent of hazardous materials contamination is known and represents an acceptable time and cost risk.

This document evaluated two new design options with an aerial instead of a tunnel alignment into the Airport as under Alternative VI. Both of options included an aerial wye-stub alignment through the west-of-Bayshore parcel and a mainline track alignment immediately east of the CalTrain tracks along the western border of the west-of-Bayshore parcel. In the west-of-Bayshore property the two aerial design options have similar configurations. Based on the environmental information in the FRDEIR/S#2DEIS and on preliminary evaluation of comments received, on November 28 and 29, 1995 the BART and SamTrans Boards modified the Alternative VI LPA, from south of Angus Avenue in San Bruno to the end of the tailtracks in Burlingame to incorporate an aerial design option. It is those project elements of these two options that involve the west-of-Bayshore parcel that constitute the proposed action that this BA is addressing. The reader should refer to the FRDEIR/S#2DEIS for more details on these options and the reasons for their considerations.

- The USFWS Recovery Plan (1985) for the' San Francisco Garter Snake (SFGS), defines the plan to reduce the danger of extinction of the remaining populations of the SFGS. The USFWS is currently in the process of revising this plan (per. com. Alison Willy, Biologist, USFWS, 1995).

The reader may refer to these documents for greater detail descriptions of the project alternatives and the newly selected Locally Preferred Alternative (Alternative VI Aerial Design Option), impacts of the new Locally Preferred Alternative, and life requirements of the SFGS, California red-legged frog and San Francisco forktail damselfly.

2.0 Proposed Action

2.1 Project Description

The Alternatives VI Aerial Design Option, the Locally Preferred Alternative, is a design option of the Alternative VI identified in the DEIR/SDEIS for the BART–San Francisco Airport Extension Project. This Design Option extends from Angus Avenue in San Bruno to the Millbrae Station and tailtrack (see Figure 2-1). The alignment, stations, and ancillary facilities are identical to those of Alternative VI evaluated in the BART–San Francisco Airport Extension DEIR/SDEIS from the end of the Colma tailtrack to Angus Avenue south of downtown San Bruno.

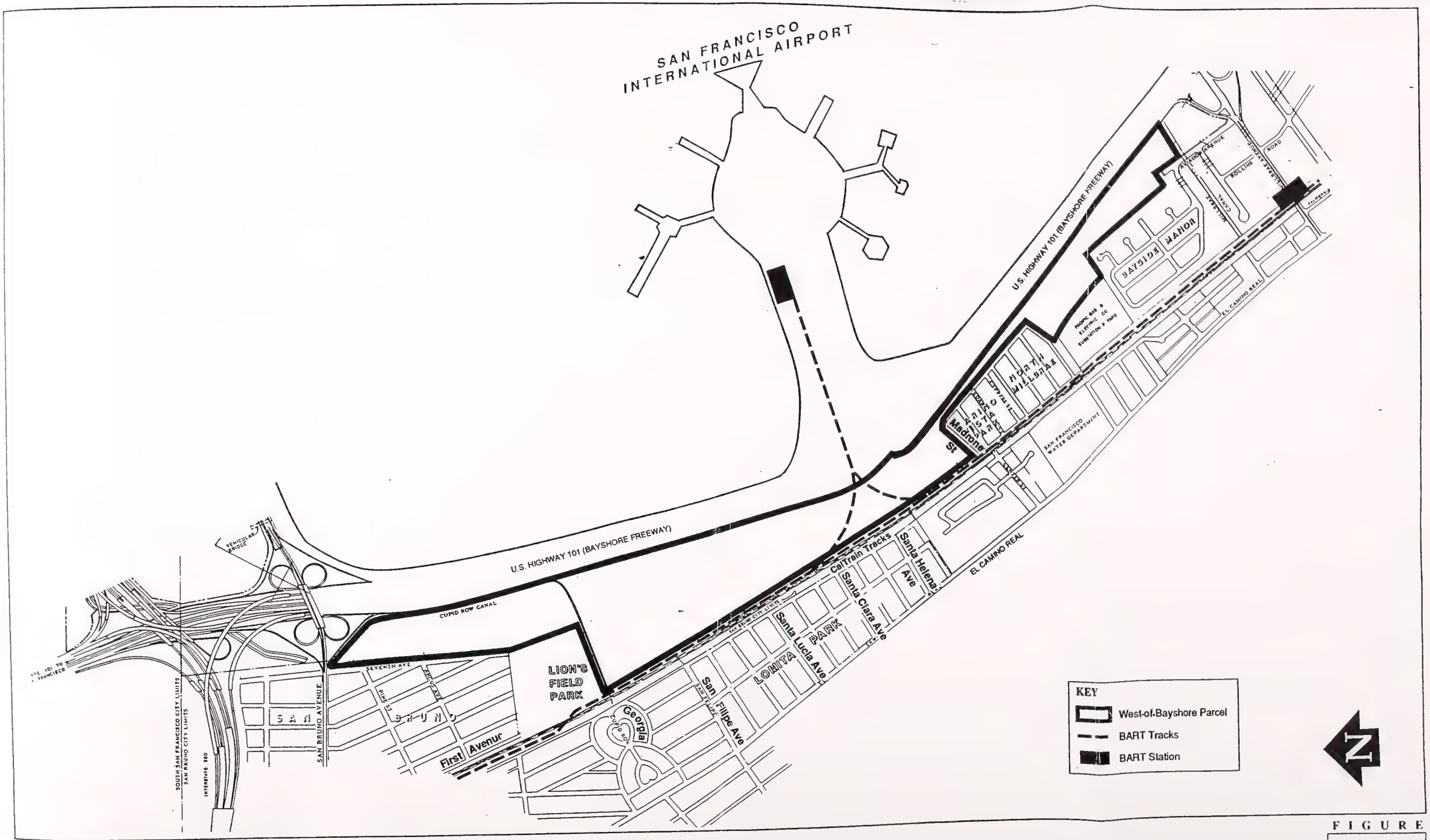

FIGURE 2-1

Alternative VI Aerial Design Option to the Airport International Terminal

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The Aerial Design Option differs from Alternative VI only in the segment between Angus Avenue in San Bruno to the end of the Millbrae Avenue Station tailtracks in Burlingame. This includes the segment adjacent to and through the west-of-Bayshore parcel. Instead of a tunneled subway alignment to the planned San Francisco Airport International Terminal as in Alternative VI, the Aerial Design Option LPA provides an east-west aerial wye (Y) stub perpendicular to the CalTrain mainline terminating at the planned SFIA Terminal, under construction by the SFIA. The Aerial Design Option LPA would also provide straight-through mainline service along the CalTrain right-of-way to a Millbrae BART/CalTrain Intermodal Station located at Millbrae Avenue.

South of Angus Avenue in San Bruno, the subway alignment would transition from the west to the east side of the CalTrain tracks and continue in subway to Georgia Avenue. Between Georgia Avenue and San Felipe Avenue, the north leg of the wye-stub would split off from the mainline tracks and the two lines would rise to ground level. South of San Felipe Avenue, the mainline would continue in a retained fill configuration south parallel to the CalTrain tracks and the west-of-Bayshore property to the subway portal approximately 300 feet north of Madrone Street in Millbrae.

The north and south legs of the aerial wye (Y) stub would ascend from and curve east on aerial structures over the SFIA west-of-Bayshore property, crossing through the existing location of the PG&E power lines. Over Highway 101 the north and south legs of the aerial wye would join to form one structure. The aerial structure would cross Highway 101 approximately 50 feet above grade to clear the existing elevated highway ramps to the SFIA International Terminal Station.

A sound wall would be provided between the BART and CalTrain mainline tracks from approximately 400 feet north of San Felipe Avenue in San Bruno to the subway portal approximately 300 feet north of Madrone Street in Millbrae.

One span (approximately 1,000 feet) of the existing overhead PG&E power transmission lines west of Highway 101 would be modified and raised over the BART aerial wye-stub structures.

2.2 Construction Scenario

The following information on the construction scenario is summarized from the *Construction Scenario Report*, dated August 1995, the *BART–San Francisco Airport Extension FRDEIR/S#2DEIS* and the *PG&E Feasibility Study to Relocate/Raise the San Mateo-Martin 115 kV Tower Lines*, dated November 1995. This section presents the most current information available regarding construction methods, activities, and duration. Specific construction practices will vary with access to work areas, soil conditions, proximity of adjacent structures, extent of utilities relocation, traffic control requirements, and permissible noise levels (among other requirements).

Preconstruction Activities

Geotechnical Field Investigation. The purpose of the proposed Geotechnical Field Investigation is to obtain data on soils and ground-water levels for the proposed BART/SFIA Extension. BART has held informal consultations with the USFWS on the entire Geotechnical Field Investigation Program on the west-of-Bayshore parcel. Based on USFWS recommendations, the Field Investigation Program was split into two phases. This BA addresses the effects of the eight test locations of the second phase of the Field Investigation Program. The initial first phase addressed 24 of the 28 proposed soil boring sites and 13 of the 17 proposed cone penetrometer sites. These 37 test sites were identified as either "no affect" or "not likely adversely affect" the SFGS during the field review in November. BART submitted a BA on the first phase of the planned geotechnical field investigations in November 1995 and received concurrence from USFWS in January 1996 that this work may proceed. The remaining eight test locations (4 soil boring and 4 cone penetrometer sites) were determined "likely to adversely affect" the SFGS during the field review and thus postponed to the second phase of the Field Investigation Program.

The proposed second phase of this program includes 4 exploratory soil boring holes (BH) and 4 cone penetrometer (CP) tests. The proposed test locations of this second phase on the west-of-Bayshore site are depicted in Figures A and B in Appendix A and are designated as CP-13 through and including CP-16 and BH-16, 18, 19, and 20.

The proposed test locations have been selected specifically to avoid all wetlands and sensitive habitat on the west-of-Bayshore site to the maximum extent possible. Access to test sites will be by existing roadways and across upland areas at selected points and shown in Figures A and B in Appendix A. The drilling equipment will be mounted on a single-axle, four wheel drive truck with maximum gross vehicle weight of 16,000 pounds (Figure C, Photograph 1 in Appendix A). The drill rig may be accompanied by a small water truck or water trailer. Engine noise for the rig is similar to a small backhoe or tractor. The exploratory soil borings will be eight inches in diameter and 50 to 100 feet deep. Soil samples will be collected for laboratory testing.

Each boring will require about six hours from start to finish. Soil samples will be taken about every 20 minutes by driving a sample tube into the soil with hammer blows similar to the sound of a sledge hammer striking a metal plate. Jobsite personnel will include a driller, driller's helper, engineer, and biological monitor for a total of four people.

Temporary PVC casing will be installed in BH-19 to allow monitoring of groundwater levels. Downhole geophysical testing to determine dynamic soil properties for earthquake design will be conducted at BH-20. For these borings, lockable metal covers (Christy Boxes) will be installed over the casing and flush with the ground surface

CP test holes will be two inches in diameter and up to 100 feet deep. The test equipment will be mounted on a single-axle, four wheel drive truck with maximum gross vehicle weight of 16,000 pounds (Figure C, Photograph 2 in Appendix A). Engine noise for the rig is similar to a standard small highway truck. Each test will require about one hour from start to finish. There will be no sampling noise with this rig. Jobsite personnel will include an operator, engineer, and a biological monitor for a total of three people.

Both exploration methods are unobtrusive and will cause very little or no ground disturbance. Excess drill cuttings will be collected and disposed of offsite. Upon completion of testing and monitoring, all holes will be backfilled to the ground surface with a non-toxic polymer grout. All activities will be planned and executed to limit site disturbance to an absolute minimum. There will be no on-site fueling of equipment.

Completion of the field investigations will take no more than 5 working days, barring adverse weather conditions.

PG&E Transmission Lines. In order for the BART aerial structure to clear the existing elevated Airport ramps it must cross through the location of the existing PG&E transmission lines and cross over Highway 101 at approximately 50 feet. PG&E will raise the transmission lines by erecting five or six new tubular steel poles approximately 135 feet in height adjacent to the proposed BART supporting columns for the aerial structures. The poles would be of sufficient height to provide a 34.0 foot clearance from the bottom conductor, a Public Utilities Commission (PUC) requirement, over the BART tracks at maximum operating temperature. It may be possible that only one pole will be required at the most easterly crossing depending on total height requirement and the FAA height limitations. The steel poles would be located in line with the existing tower line and approximately 10 feet away from the proposed BART aerial structure. The existing lattice steel towers immediately north and south of the BART alignment would be reinforced with stronger lattice steel structures. All structures involved in construction would be insulated with composite insulators.

Because the transmission lines are the primary source of electric power to the north peninsula area and the City of San Francisco, construction on these lines would allow only one of six circuits to be temporarily taken out of service at any given time. The interruption of service of even one line cannot be continuous for an extended period of time. There are three towers on each side of the proposed BART alignment each carrying two circuits. A temporary wood pole shoo-fly or by-pass line would carry two circuits next to and west of the existing PG&E right-of-way along the existing dirt access road during construction. The shoo-fly line would be approximately 4,000 to 10,000 feet in length, depending on the strength of the existing towers, and designed to avoid the placement of any poles within any wetland (see Figure A in Appendix B). Placement of the shoo-fly poles would require a standard PG&E single truck vehicle with an auger drill. The placement and stringing of electrical lines on each pole will take approximately a total of one-half work day (four hours) to complete. The three sets of two circuits would have to be built consecutively. Once the poles are up and the lines are strung, PG&E would not have to access these sites for maintenance beyond what they now require for the existing powerlines. The shoo-fly would remain in place until the work on the affected lines is completed.

Installation of the new tubular towers will require the placement of temporary supporting base materials (steel plates on geotexile fabric) for temporary construction access. The temporary access road would be approximately 50 - 75 feet in width and cover up to a maximum of approximately .22 acres within the wetland area between the two aerial wye stubs (see Figure A in Appendix B). The exact location of this temporary construction access road has not been determined and will depend upon the final location of the tubular towers, however, the attached graphic represents the worst case scenario. BART would require that this temporary access road of either steel plates or geotextile matting material to reduce the amount of soil compaction and surface disturbance and enhance the recovery of the wetland when the steel plates and matting are removed after the towers are erected. In addition, during non construction periods (e.g. weekend) these materials will be temporarily removed to allow sunlight to reach wetland vegetation. Construction equipment expected to be required for the erection of the tubular towers would include cranes, cement trucks, manual line trucks, and various supply trucks. The strengthening of the existing lattice towers immediately north and south of the proposed BART aerial wye stubs would require a bucket truck and manual line trucks. The footings for each tubular tower would be approximately 15 feet square or 225 square feet each. All construction access to the site would be via the existing paved and dirt access roads on the west-of-Bayshore parcel south of the construction site. Depending upon when the construction is to occur, it may be necessary to improve and convert the dirt roads to all weather roads to the construction site by placing temporary geotextile fabric on existing roads.

Two sections of the BART-SFO Extension are proposed to be built on the west-of-Bayshore property, the aerial wye-stub and the main activities associated with these sections are described below. Total construction time is estimated to be seven months. The construction of the shoo-fly would require one month and each tower line would need approximately two months to complete. The tower lines have to be built consecutively.

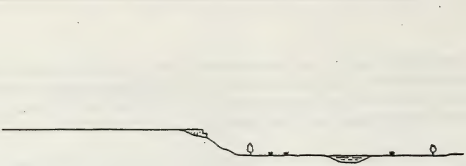
Project Construction Activities

Aerial Wye-Stub The north and south legs of the aerial wye (Y) stub would run east across the west-of-Bayshore parcel in an aerial configuration. The first step in the construction of the BART aerial wye-stub would be the clearing of all woody vegetation from a 70- to 100-foot-wide construction corridor along the alignment on the west-of-Bayshore parcel. The vegetation clearing would start at the westerly end of the north and south wye-stub legs. All tree and brush vegetation removed from the construction corridor hauled away by the contractor. Vegetation clearing activities are expected to be completed within a period of approximately three months.

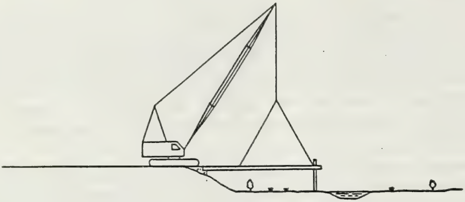
BART would provide access along the construction corridor in support of the building of the aerial wye-stubs on a 40-foot-wide (approximate) temporary trestle bridge. The temporary trestle bridges (one for each wye-stub leg) would be supported on pilings driven into the earth. The bridge platform upon which construction equipment would travel would be elevated above the ground surfaces to allow for free movement of water and wildlife during the time the bridges are in place. A platform would be installed on the pilings for the heavy equipment to travel upon. Figures 2-2 through 2-4 illustrate the sequence of trestle bridge construction. The temporary trestle bridges are expected to be in place for approximately one and a half years (18 months).

The BART aerial wye-stubs and their support columns would be built from the temporary construction trestle bridges. Figures 2-5 through 2-10 illustrate the construction sequence for the aerial wye-stubs. Construction would commence from the westerly end of the alignment, adjacent to the existing CalTrain tracks, and proceed easterly across the west-of-Bayshore parcel. All excavated material would be removed and disposed of off-site. The aerial wye stubs would be supported by columns spaced an average of 80 feet apart with concrete and rebar caisson foundations supporting the columns. Concrete cap footings will be formed and poured on top of the caissons below the existing ground surface. Construction of the caisson foundations is expected to take approximately eight (8) months.

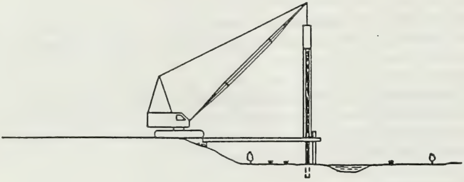
After the construction of foundations and support columns, the aerial superstructure (trackway deck) would be constructed utilizing either prefabricated steel girders, precast concrete box girders using segmental construction or cast-in-place concrete box girders. All materials as required for the alternative superstructure schemes would be handled by special dollies designed for use on the temporary construction trestle and lifted in place by cranes operating on the construction trestle. For the cast-in-place scheme, the falsework would be supported on the concrete footings only; erection and removal of falsework would be accomplished from the construction trestle. Native soil will be backfilled over the footings after the superstructure is in place.



Step 1: Construct Launching Ramp



Step 2: Place Pile Template



Step 3: Drive Temporary Trestle Support Piles

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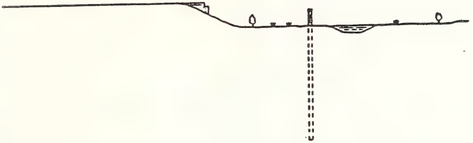
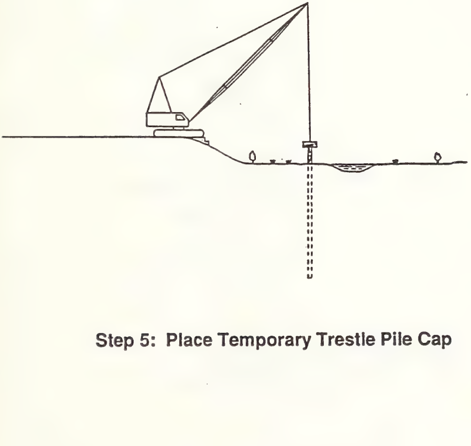
Construction Sequence for Temporary Trestle Bridge Across West-of-Bayshore Parcel

FIGURE

2-2



Step 4: Remove Pile Template



Step 5: Place Temporary Trestle Pile Cap

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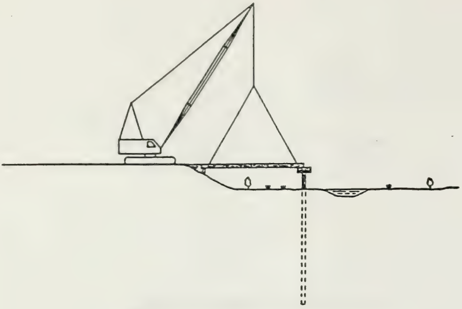
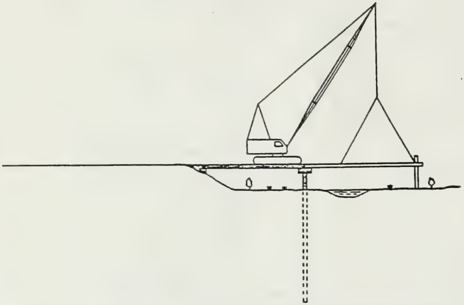
Construction Sequence for Temporary Trestle Bridge
Across West-of-Bayshore Parcel

FIGURE

2-3



Step 6: Place Temporary Trestle Girders

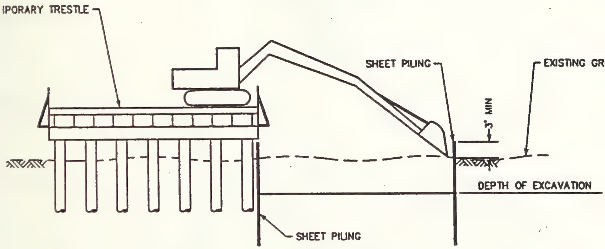


Step 7: Move on to Temporary Trestle Span
and Repeat Steps 2 through 6

Construction Sequence for Temporary Trestle Bridge
Across West-of-Bayshore Parcel

FIGURE

2-4

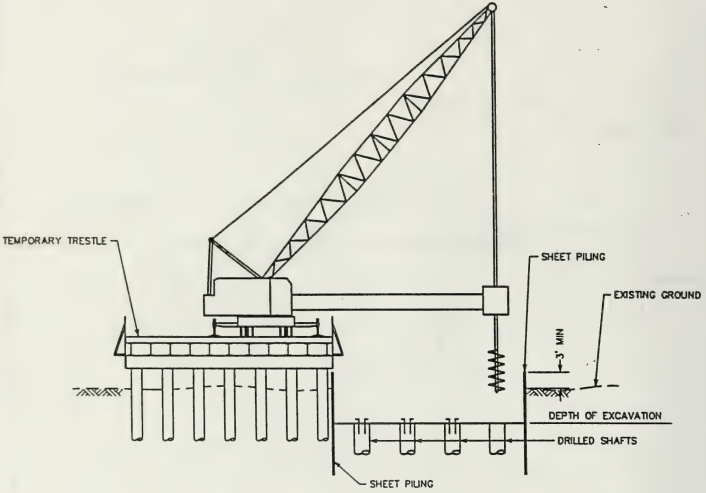


Step 1: Install Sheet Piling and Excavate for Footing

Construction Sequence for Aerial Wye-Stub
Across West-of-Bayshore Parcel

FIGURE

2-5

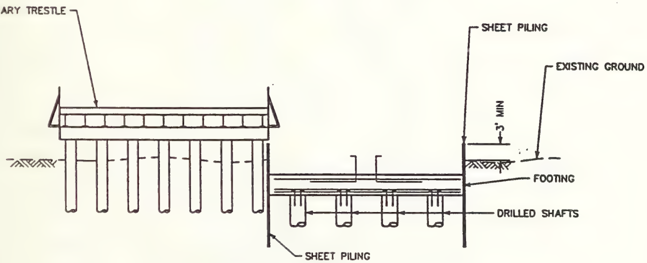


Step 2: Install Drilled Shafts

Construction Sequence for Aerial Wye-Stub Across West-of-Bayshore Parcel

FIGURE

2-6

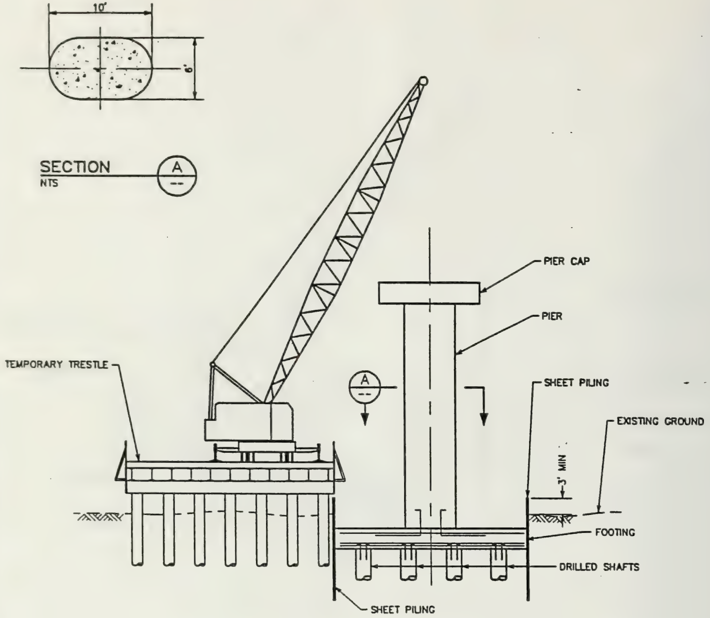


Step 3: Construct Footing

Construction Sequence for Aerial Wye-Stub
Across West-of-Bayshore Parcel

FIGURE

2-7



Step 4: Construct Pier and Structural Steel Pier Cap

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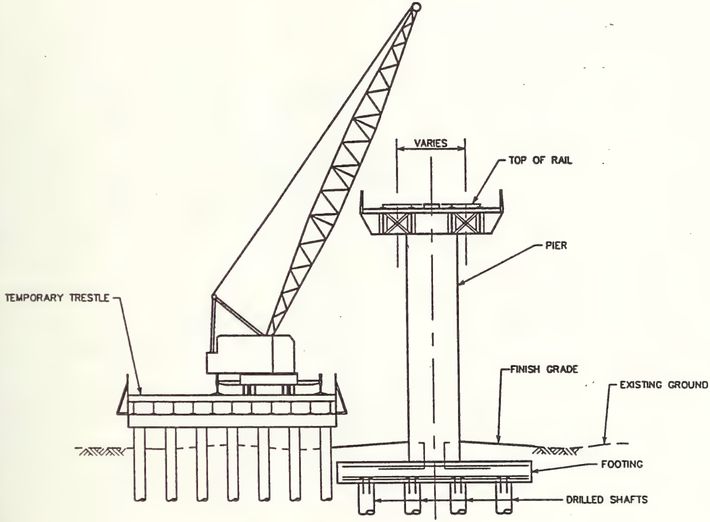
Construction Sequence for Aerial Wye-Stub
Across West-of-Bayshore Parcel

FIGURE

2-8



Step 5: Construct Superstructure and Install Rails, Traction Power, Control and Communication Systems

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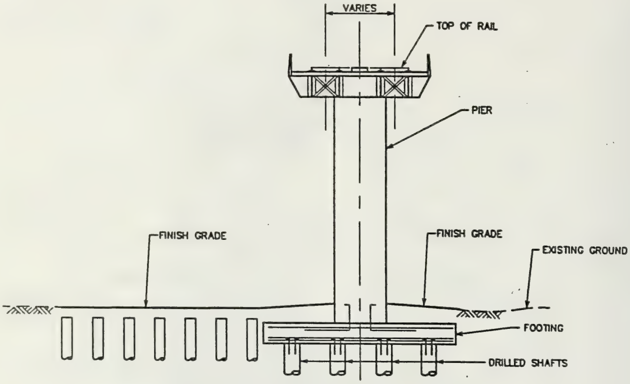
Construction Sequence for Aerial Wye-Stub Across West-of-Bayshore Parcel

FIGURE 2-9



Step 6: Remove Trestle and Restore Site

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Construction Sequence for Aerial Wye-Stub Across West-of-Bayshore Parcel

FIGURE

2-10

The construction trestles would remain in place 18 months during construction but would be removed prior to system installations and testing. After the BART aerial wye-stubs have been erected, all vegetation would be allowed to reestablish within the corridor with the exception of large trees adjacent and underneath the aerial structures.

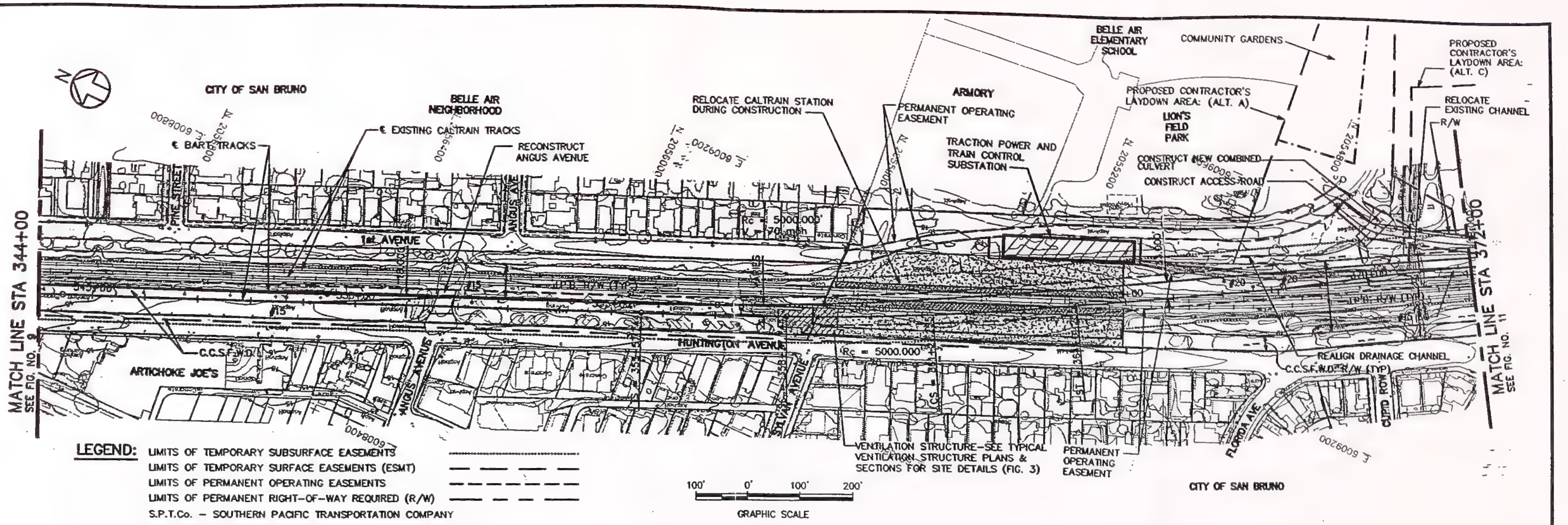
Mainline

Retained Fill Sections. Retained fill sections would occur east of and parallel to the CalTrain mainline from 200 feet south of San Felipe Avenue in San Bruno to the subway portal approximately 300 feet north of Madrone Street in Millbrae (see Figures 2-11 through 2-14). Figures 2-15 and 2-16 show typical retained fill cross sections adjacent to the west-of-Bayshore property. In retained fill sections small to medium height reinforced concrete walls are used to "retain" the fill material used to elevate the tracks higher than the existing grade. After tree and shrub removal, clearing and grubbing and utility relocation, the reinforced concrete retaining walls would be constructed, followed by the importing and compacting of engineered fill material to bring the level up to subgrade height, and placement of sub-ballast, ballast, trackwork, and power and control equipment. Generally, retained fill line construction can be expected to progress 400 feet per week and would be supported from a temporary construction road along the easterly side of the new BART tracks. Based on the preliminary schedule for completion of Segment 2, the estimated time of construction for the retained fill section is approximately 7 months.

Cut-and-Cover Subway Section. A typical cut-and-cover box section will be 10 feet below surface, in order to accommodate underground utilities and landscaping. Cut-and-cover construction is planned to occur at the north and south ends of the mainline alignment next to the west-of-Bayshore parcel. At the northern end this construction technique will extend from Angus Avenue to approximately 500 feet South of Cupid Row Canal. The southern end of the cut-and-cover construction will extend south from a point approximately 300 feet north of Madrone Street to approximately 200 feet north of Millbrae Gardens. Following shoring and excavation operations, the line section subgrade would be compacted and graded, and underground subdrains installed as necessary. This process would be followed by placing concrete for the bottom slab foundation. Frequent concrete pours (every two to five days) of 60 to 600 cubic yards or more (six to 60 ready-mix truck loads) can be expected as work proceeds.

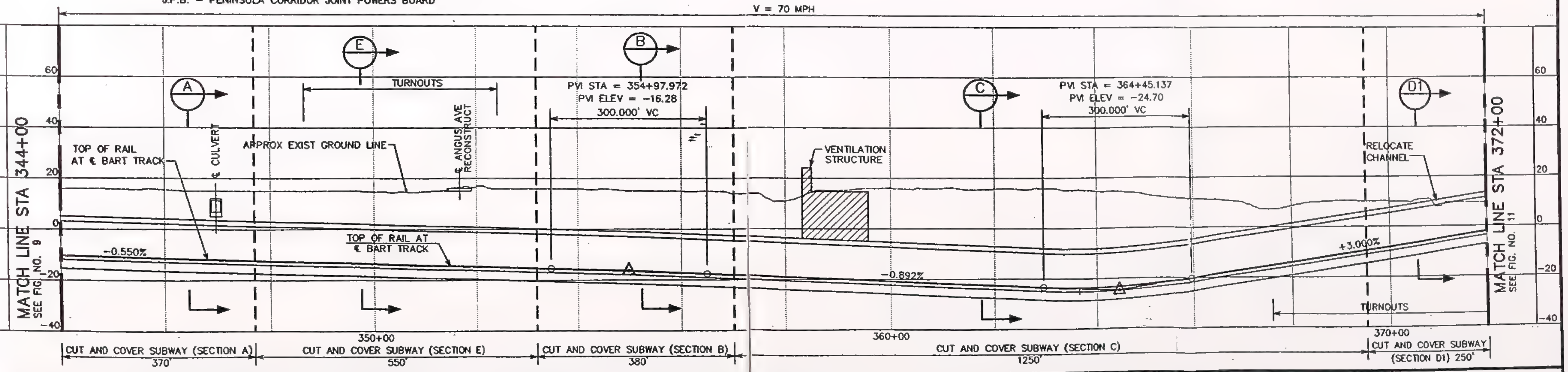
The shoring system may be able to serve as the outside form for the concrete box. Panels would be nailed to the shoring system if required to waterproof the walls. Rebars would be placed, collapsible formwork installed, and concrete poured for the sides and roof of the box. Waterproofing may be provided over the roof of the subway structure and a concrete mix poured on top to protect the waterproofing during backfill. The roof and sides of the box would cure for approximately three to seven days (concrete must reach 70 percent of design strength) before the traveling forms are collapsed and moved ahead to the next sections. The box can be backfilled after the section has reached 90 percent of full 28 day design strength. The construction rate for shallow cut-and-cover subway section is approximately 100 feet per week. Based on the rate of construction progress, the estimated time of construction for the cut-and-cover sections is approximately 18 months.

Retained-Cut or Transition Sections. At each portal retained-cut of the alignment transition between cut-and-cover subway and retained fill track alignments, are planned to occur at two points along the alignment next to the west-of-Bayshore parcel. The northern section will extend south from the end of the cut-and-cover section approximately 600 feet to a point between San Felipe and San Luis Avenues. The southern section will extend south from a point approximately 500 feet north of the southern cut-and-cover section described above. It is expected that nearly all proposed retained-cut line sections would be U-shaped concrete structures placed an average 20 feet below ground. Construction of this type of structure is similar to that of subway lines, except there is no top slab. For shallow depths, open cut instead of shoring would be utilized. In deeper depths, temporary shoring walls constructed of sheet piling or soldier beams and lagging would be employed. Generally, retained-cut sections require more utility relocation work than cut-and-cover sections, because utilities can not be suspended above the retained cut as they can be


CITY OF SAN BRUNO
BELLE AIR NEIGHBORHOOD
℄ BART TRACKS
℄ EXISTING CALTRAIN TRACKS
RECONSTRUCT ANGUS AVENUE
RELOCATE CALTRAIN STATION DURING CONSTRUCTION
ARMORY
PERMANENT OPERATING EASEMENT
TRACTION POWER AND TRAIN CONTROL SUBSTATION
BELLE AIR ELEMENTARY SCHOOL
COMMUNITY GARDENS
PROPOSED CONTRACTOR'S LAYDOWN AREA: (ALT. A)
LION'S FIELD PARK
CONSTRUCT NEW COMBINED CULVERT
CONSTRUCT ACCESS ROAD
PROPOSED CONTRACTOR'S LAYDOWN AREA: (ALT. C)
RELOCATE EXISTING CHANNEL
R/W
PINE STREET
ANGUS AVE
1st AVENUE
Rc = 5000.000'
V = 70 mph
J.P.B. R/W (TYP)
HUNTINGTON AVENUE
ANGUS AVENUE
SYLVAN AVENUE
C.C.S.F.W.D.
ARTICHOKE JOE'S
Rc = 5000.000'
VENTILATION STRUCTURE-SEE TYPICAL VENTILATION STRUCTURE PLANS & SECTIONS FOR SITE DETAILS (FIG. 3)
PERMANENT OPERATING EASEMENT
REALIGN DRAINAGE CHANNEL
C.C.S.F.W.D. R/W (TYP)
FLORIDA AVE
CUPID ROW
CITY OF SAN BRUNO
MATCH LINE STA 344+00 SEE FIG. NO. 9
MATCH LINE STA 372+00 SEE FIG. NO. 11
100' 0' 100' 200'
GRAPHIC SCALE

LEGEND:

- LIMITS OF TEMPORARY SUBSURFACE EASEMENTS ┈┈┈┈
- LIMITS OF TEMPORARY SURFACE EASEMENTS (ESMT) — — —
- LIMITS OF PERMANENT OPERATING EASEMENTS – – – –
- LIMITS OF PERMANENT RIGHT-OF-WAY REQUIRED (R/W) —— – —— –
- S.P.T.Co. – SOUTHERN PACIFIC TRANSPORTATION COMPANY
- C.C.S.F.W.D. – CITY AND COUNTY OF SAN FRANCISCO WATER DEPT.
- J.P.B. – PENINSULA CORRIDOR JOINT POWERS BOARD


V = 70 MPH
MATCH LINE STA 344+00 SEE FIG. NO. 9
MATCH LINE STA 372+00 SEE FIG. NO. 11
60
40
20
0
-20
-40
A
E
B
C
D1
TURNOUTS
PVI STA = 354+97.972
PVI ELEV = -16.28
300.000' VC
PVI STA = 364+45.137
PVI ELEV = -24.70
300.000' VC
TOP OF RAIL AT ℄ BART TRACK
℄ CULVERT
APPROX EXIST GROUND LINE
℄ ANGUS AVE RECONSTRUCT
VENTILATION STRUCTURE
RELOCATE CHANNEL
-0.550%
TOP OF RAIL AT ℄ BART TRACK
-0.892%
+3.000%
TURNOUTS
350+00
360+00
370+00
CUT AND COVER SUBWAY (SECTION A) 370'
CUT AND COVER SUBWAY (SECTION E) 550'
CUT AND COVER SUBWAY (SECTION B) 380'
CUT AND COVER SUBWAY (SECTION C) 1250'
CUT AND COVER SUBWAY (SECTION D1) 250'

BART

SAN FRANCISCO AIRPORT EXTENSION FEIR/FEIS

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKER OFF-TODD-WARREN
1000 BROADWAY, 4TH LOOR
OAKLAND CA 94604
(510) 874-7300

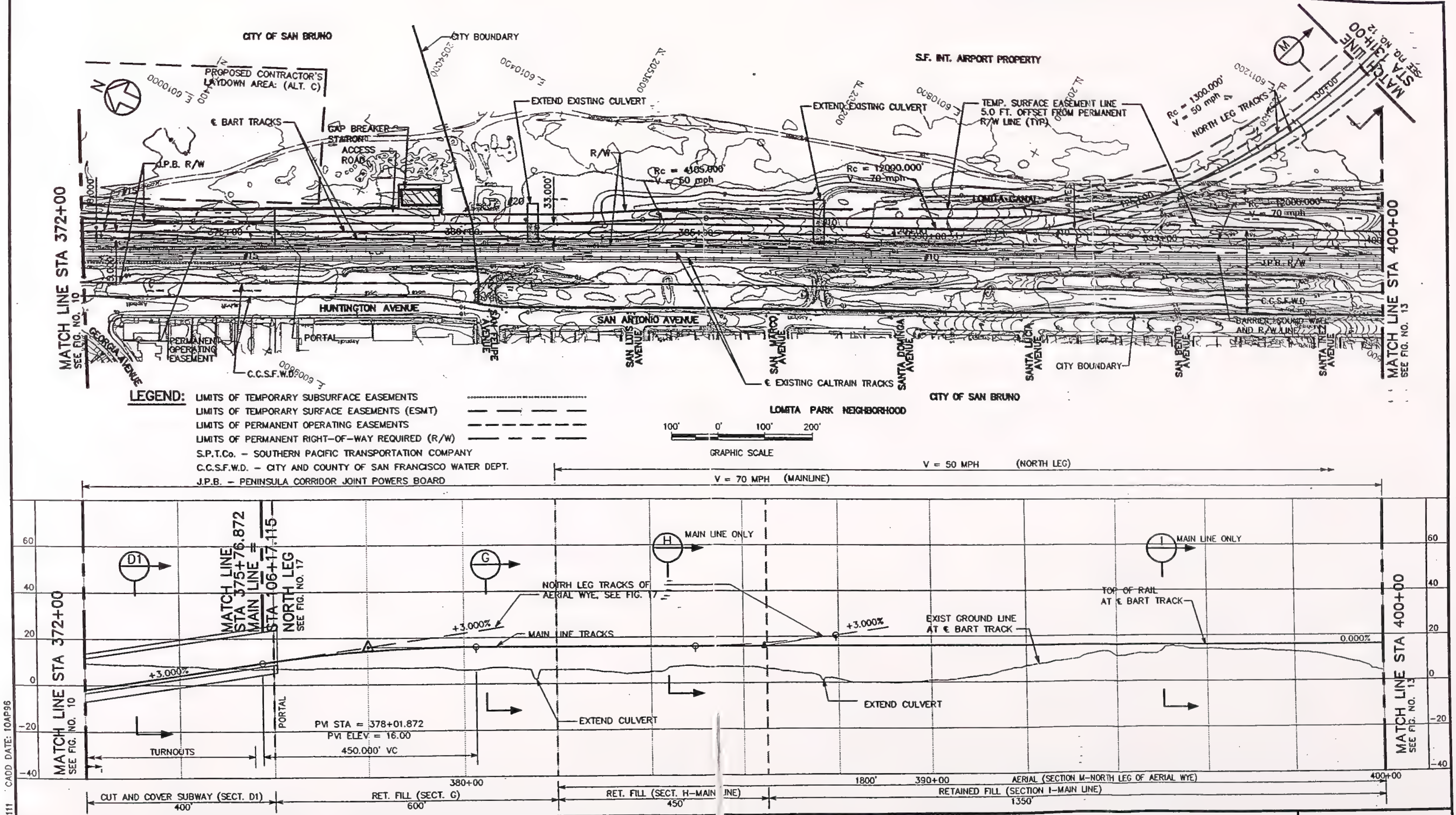
AERIAL DESIGN OPTION LPA

PLAN AND PROFILE
STA 344+00 TO STA 372+00
Plan and Profile - Pine Street to Cupid Row

1"=100'H
1"=20'V

FIGURE 2-11
DATE: 10AP96

CADD FILENAME: FEIRC110 CADD DATE: 10AP96



LEGEND:
LIMITS OF TEMPORARY SUBSURFACE EASEMENTS
LIMITS OF TEMPORARY SURFACE EASEMENTS (ESMT)
LIMITS OF PERMANENT OPERATING EASEMENTS
LIMITS OF PERMANENT RIGHT-OF-WAY REQUIRED (R/W)
S.P.T.Co. – SOUTHERN PACIFIC TRANSPORTATION COMPANY
C.C.S.F.W.D. – CITY AND COUNTY OF SAN FRANCISCO WATER DEPT.
J.P.B. – PENINSULA CORRIDOR JOINT POWERS BOARD

CADD FILENAME: FEIRC111 CADD DATE: 10AP96

BART

SAN FRANCISCO AIRPORT EXTENSION
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SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL–PARSONS BRINCKERHOFF–TODO–WARREN
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OAKLAND CA 94604
(510) 874–7300

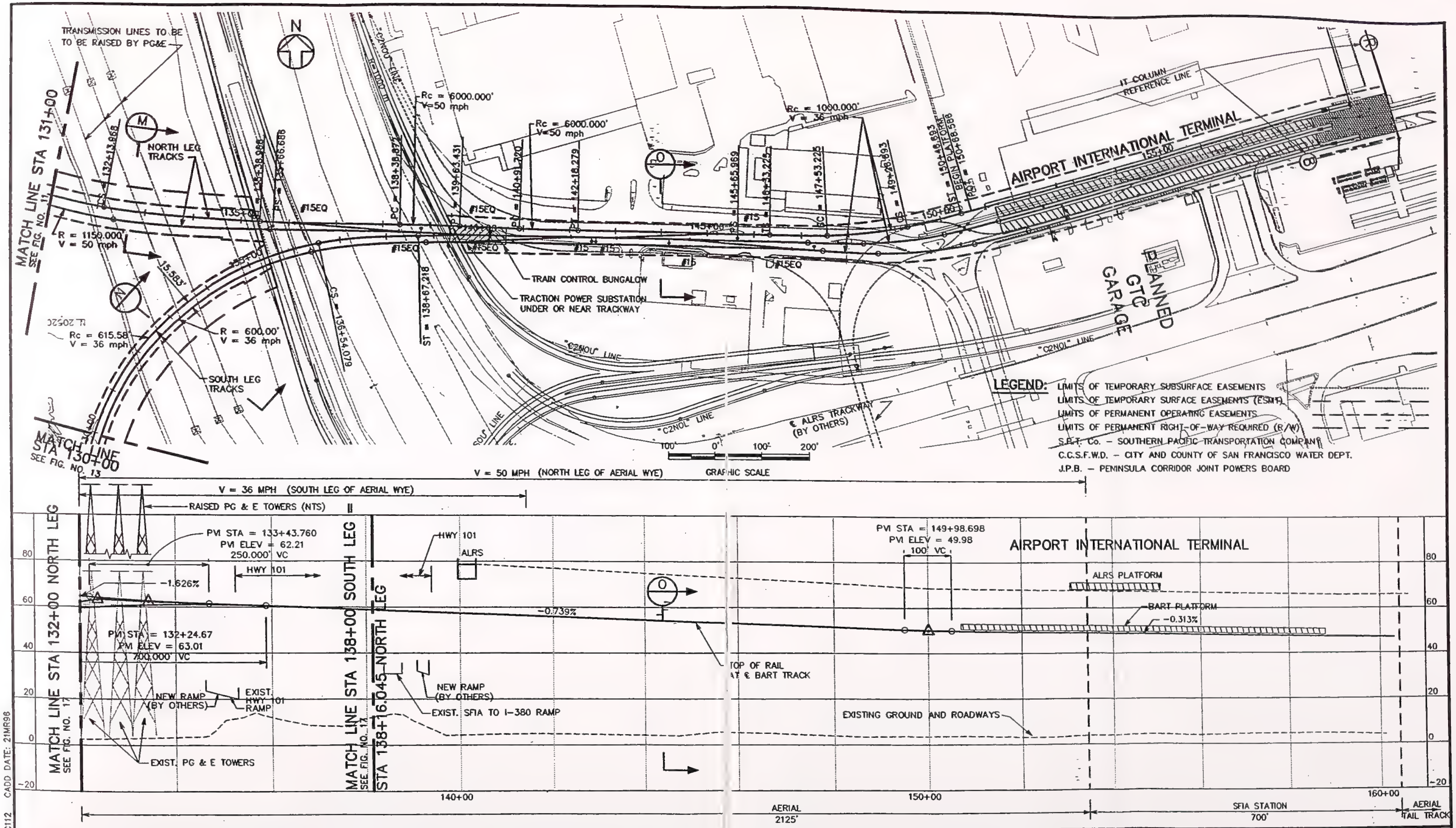
AERIAL DESIGN OPTION LPA

PLAN AND PROFILE
STA 372+00 TO STA 400+00

Plan and Profile - Georgia Ave. to Santa Inez Ave.

1"=100'H
1"=20'V

FIGURE 2-12


TRANSMISSION LINES TO BE TO BE RAISED BY PG&E
N
MATCH LINE STA 131+00 SEE FIG. NO. 11
NORTH LEG TRACKS
132+13.868
135+38.966
135+66.686
138+38.877
139+63.431
140+91.320
142+18.279
145+65.969
146+33.225
147+53.225
149+26.693
150+48.883
BEGIN PLATFORM
150+68.588
Rc = 6000.000' V=50 mph
Rc = 6000.000' V=50 mph
Rc = 1000.000' V = 36 mph
R = 1150.000' V = 50 mph
15.583°
Rc = 615.58' V = 36 mph
R = 600.00' V = 36 mph
SOUTH LEG TRACKS
ST = 138+67.218
CS = 136+54.079
TRAIN CONTROL BUNGALOW
TRACTION POWER SUBSTATION UNDER OR NEAR TRACKWAY
"C2NOU" LINE
"C2NOL" LINE
"SOU" LINE
ALRS TRACKWAY (BY OTHERS)
IT COLUMN REFERENCE LINE
AIRPORT INTERNATIONAL TERMINAL
155+00
PLANNED GTC GARAGE
MATCH LINE STA 130+00 SEE FIG. NO. 13
100' 0' 100' 200'
GRAPHIC SCALE
LEGEND:
LIMITS OF TEMPORARY SUBSURFACE EASEMENTS
LIMITS OF TEMPORARY SURFACE EASEMENTS (ESMT)
LIMITS OF PERMANENT OPERATING EASEMENTS
LIMITS OF PERMANENT RIGHT-OF-WAY REQUIRED (R/W)
S.P.T. Co. - SOUTHERN PACIFIC TRANSPORTATION COMPANY
C.C.S.F.W.D. - CITY AND COUNTY OF SAN FRANCISCO WATER DEPT.
J.P.B. - PENINSULA CORRIDOR JOINT POWERS BOARD
V = 50 MPH (NORTH LEG OF AERIAL WYE)
V = 36 MPH (SOUTH LEG OF AERIAL WYE)
RAISED PG & E TOWERS (NTS)
MATCH LINE STA 132+00 NORTH LEG SEE FIG. NO. 17
PVI STA = 133+43.760 PVI ELEV = 62.21 250.000' VC
-1.626%
HWY 101
PVI STA = 132+24.67 PVI ELEV = 63.01 700.000' VC
NEW RAMP (BY OTHERS)
EXIST. HWY 101 RAMP
EXIST. PG & E TOWERS
MATCH LINE STA 138+00 SOUTH LEG SEE FIG. NO. 17
STA 138+16.045 NORTH LEG
HWY 101
ALRS
NEW RAMP (BY OTHERS)
EXIST. SFIA TO I-380 RAMP
-0.739%
TOP OF RAIL AT ℄ BART TRACK
PVI STA = 149+98.698 PVI ELEV = 49.98 100' VC
AIRPORT INTERNATIONAL TERMINAL
ALRS PLATFORM
BART PLATFORM
-0.313%
EXISTING GROUND AND ROADWAYS
80
60
40
20
0
-20
140+00
150+00
160+00
AERIAL 2125'
SFIA STATION 700'
AERIAL TAIL TRACK

CADD FILENAME: FEIRC112 CADD DATE: 21MR98

BART

SAN FRANCISCO AIRPORT EXTENSION
FEIR/FEIS

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CON ULTANTS
BECHTEL-PARSONS BRINCKERHOFF- OO-WARREN

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OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION LPA

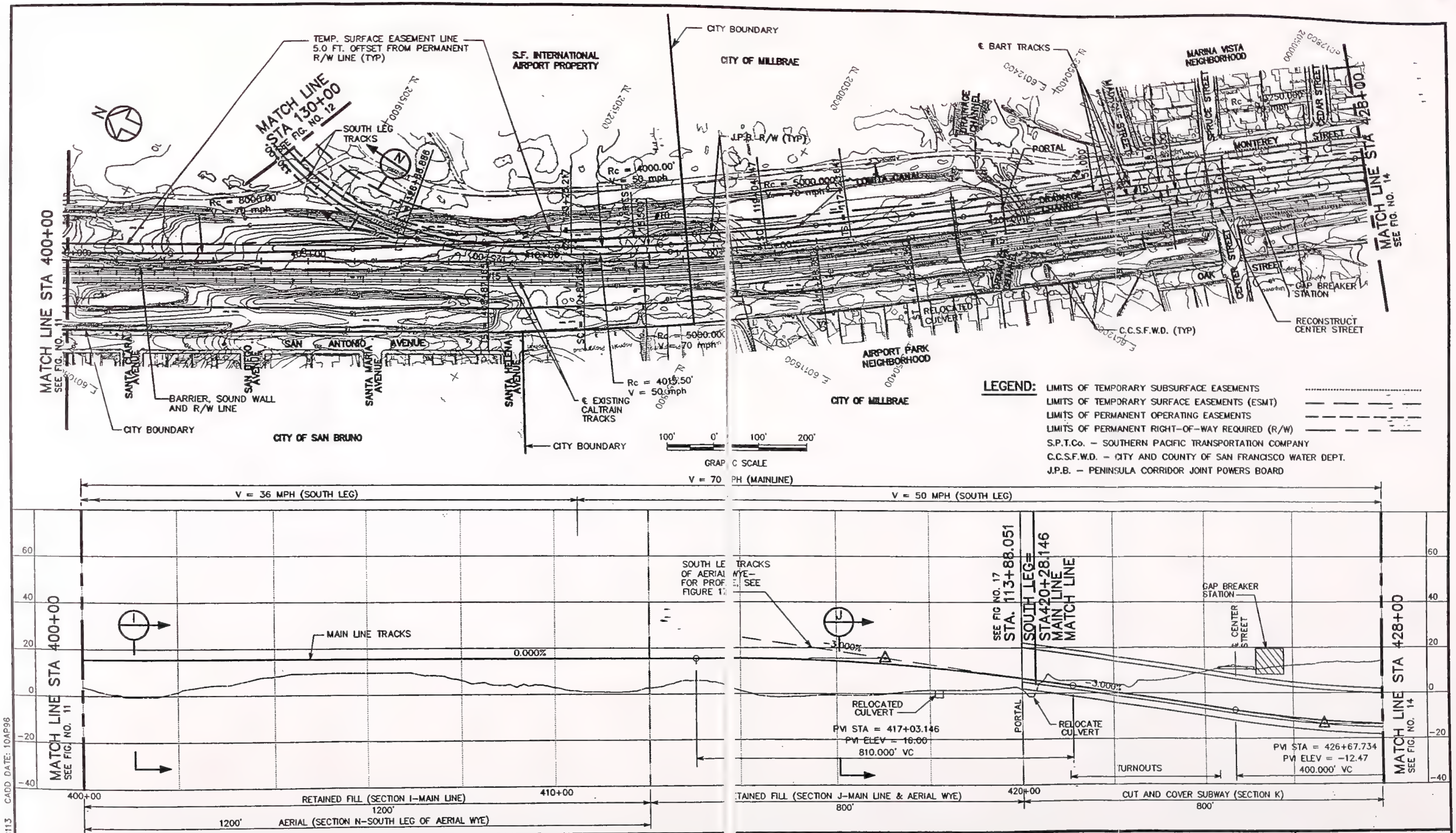
PLAN AND PROFILE
STA 132+00 TO STA 160+00

Plan and Profile - Aerial Wye Stubs to International Terminal

1"=100'H
1"=20'V

FIGURE 2-13

DATE: 21MR96



LEGEND:

LIMITS OF TEMPORARY SUBSURFACE EASEMENTS
LIMITS OF TEMPORARY SURFACE EASEMENTS (ESMT)
LIMITS OF PERMANENT OPERATING EASEMENTS
LIMITS OF PERMANENT RIGHT-OF-WAY REQUIRED (R/W)
S.P.T.Co. – SOUTHERN PACIFIC TRANSPORTATION COMPANY
C.C.S.F.W.D. – CITY AND COUNTY OF SAN FRANCISCO WATER DEPT.
J.P.B. – PENINSULA CORRIDOR JOINT POWERS BOARD

CADD FILENAME: FEIRC113 CADD DATE: 10AP96

BART

SAN FRANCISCO AIRPORT EXTENSION FEIR/FEIS

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CON ULTANTS
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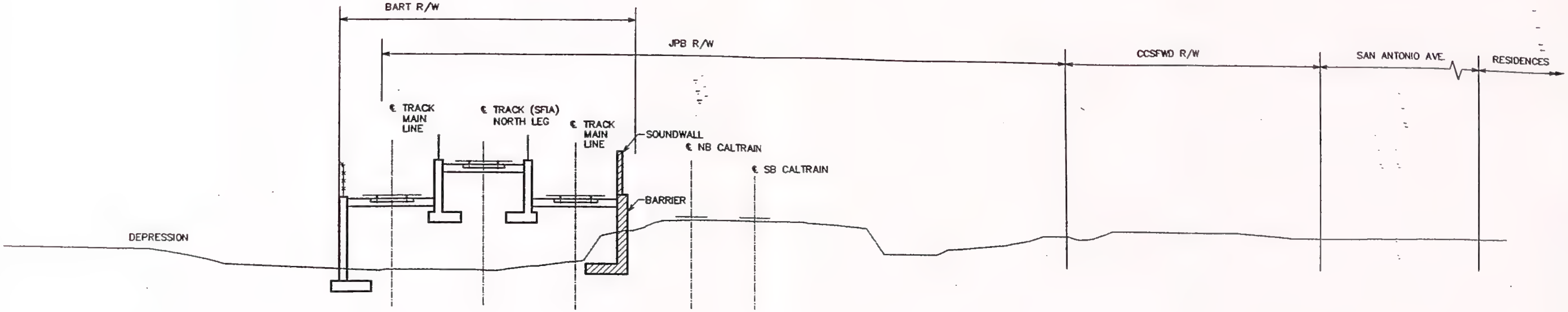
AERIAL DESIGN OPTION LPA

PLAN AND PROFILE
STA 400+00 TO STA 428+00
Plan and Profile - Santa Clara Ave. to Center Street

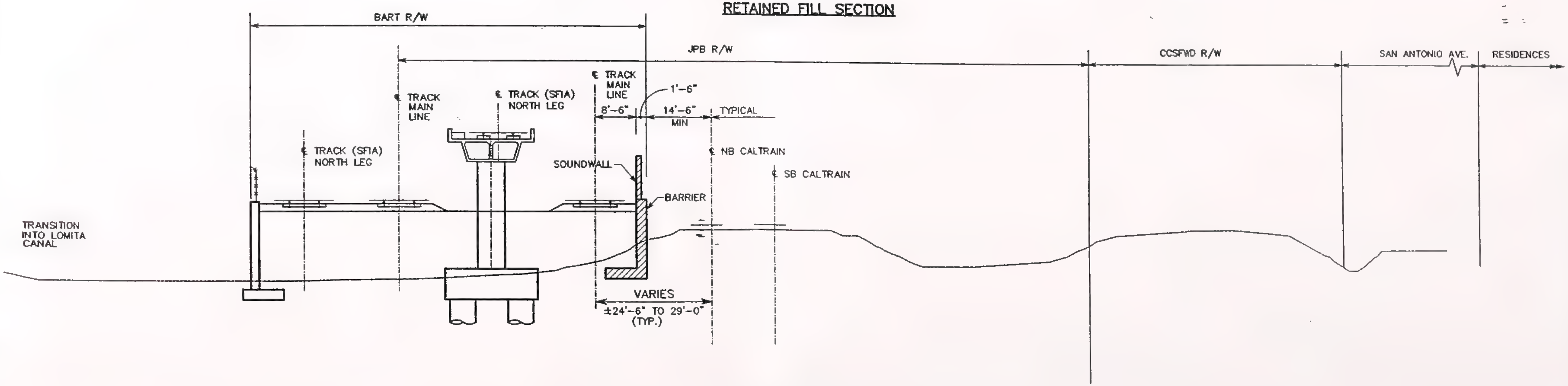
1"=100'H
1"=20'V

FIGURE 2-14
DATE: 10AP96



SECTION G

RETAINED FILL SECTION



SECTION H

RETAINED FILL SECTION

CADD FILENAME: FEIRC120 CADD DATE: 11AP96

BART

SAN FRANCISCO AIRPORT EXTENSION
FEIR/FEIS

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL–PARSONS BRINCKERHOFF–TODD–WARREN

1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

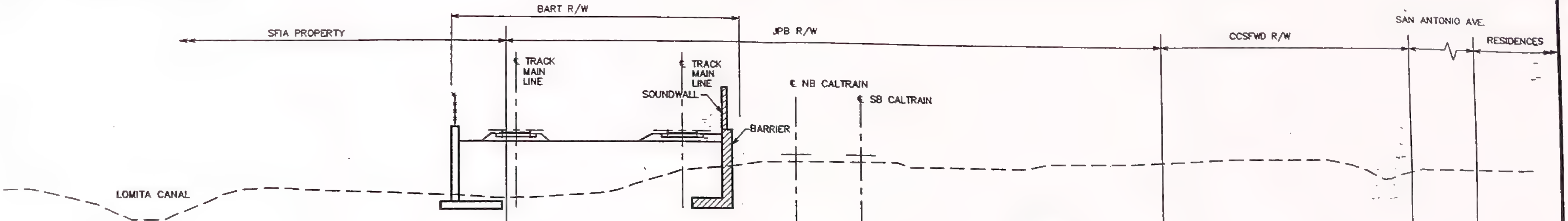
AERIAL DESIGN OPTION LPA
TYPICAL SECTIONS

Cross Sections

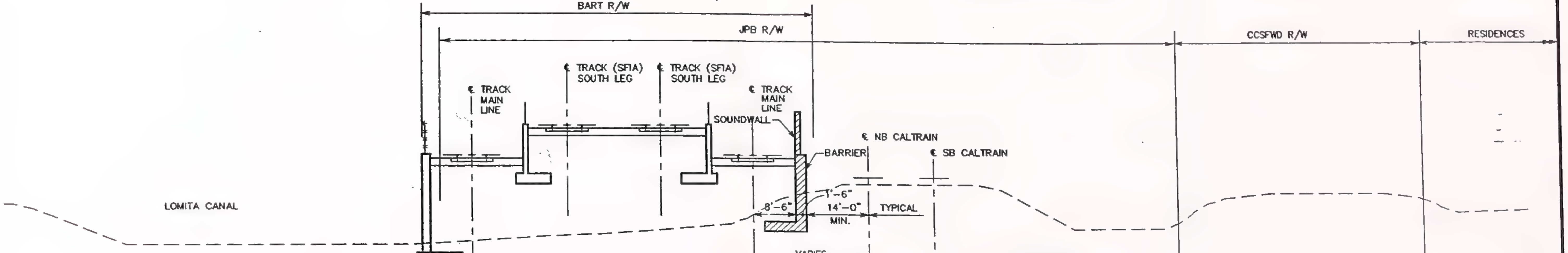
NOT TO SCALE

FIGURE 2-15

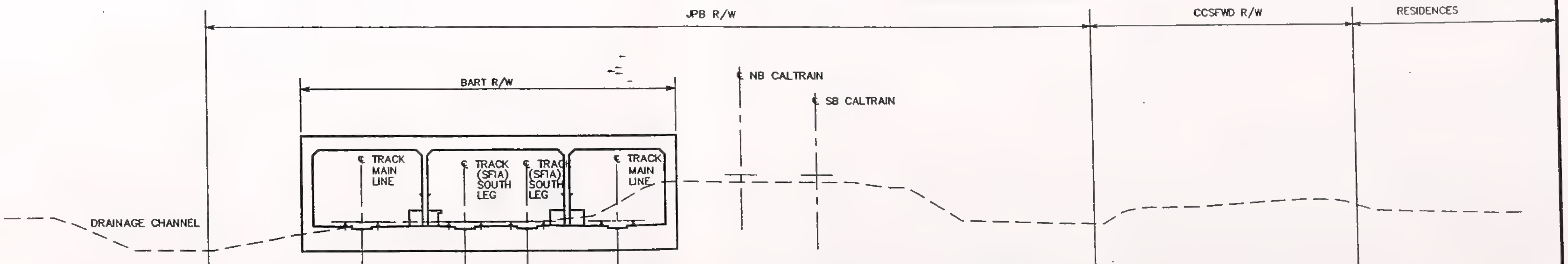
DATE: 11AP96



SECTION I
RETAINED FILL SECTION



SECTION J
RETAINED FILL SECTION



SECTION K

CADD FILENAME: FEIRC121 CADD DATE: 11AP96

BART

SAN FRANCISCO AIRPORT EXTENSION FEIR/FEIS

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODO-WARREN

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OAKLAND CA 94604
(510) 874-7300

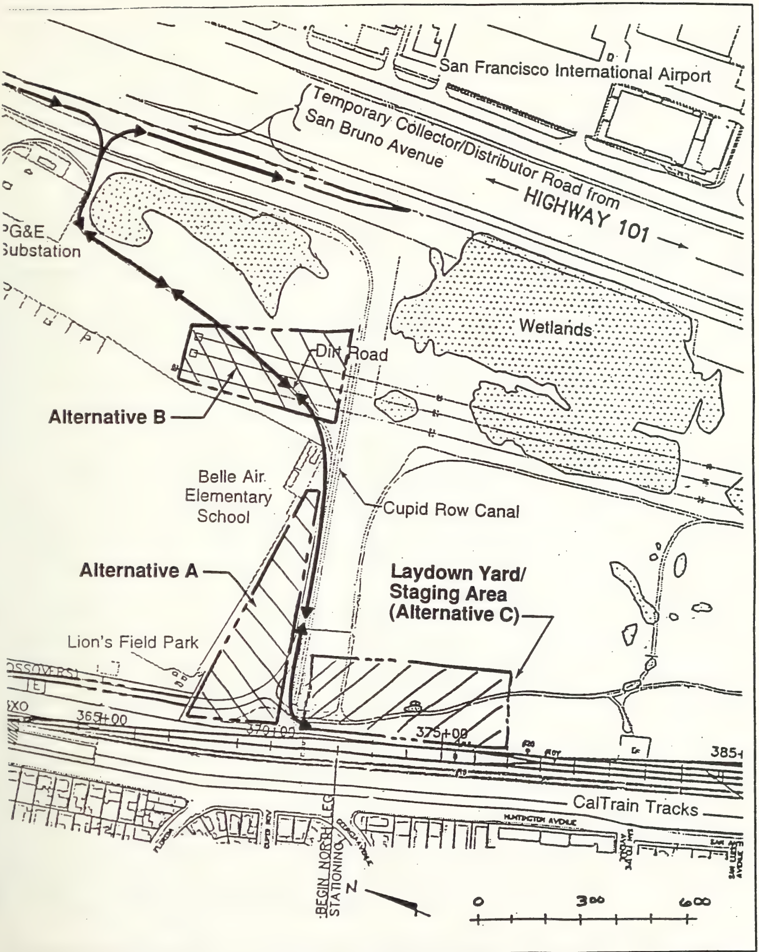
AERIAL DESIGN OPTION LPA TYPICAL SECTIONS

Cross Sections

NOT TO SCALE

FIGURE 2-16

DATE: 11AP96


San Francisco International Airport
Temporary Collector/Distributor Road from San Bruno Avenue
HIGHWAY 101
PG&E Substation
Wetlands
Dirt Road
Alternative B
Belle Air Elementary School
Cupid Row Canal
Alternative A
Laydown Yard/ Staging Area (Alternative C)
Lion's Field Park
365+00
370+00
375+00
385+
CalTrain Tracks
HUNTINGTON AVENUE
BEGIN NORTH LES STATIONING
N
0
300
600

Temporary Laydown Yard/Staging Area and Access Route

FIGURE 2-17

suspended above the cut-and-cover box during construction. Utilities (such as sewer lines) spanning retained-cut segments would have to be rebuilt or relocated in most cases. Because of the need to relocate utility lines in these retained-cut sections, the construction period is expected to last approximately seven months.

Storage Yards and Construction Staging Areas. As shown in Figure 2-17, BART has considered three alternative locations for a temporary storage yard and staging area to support construction of the BART mainline from Angus Avenue to just north of Center Street, and the aerial wye stubs between the mainline and the west side of Highway 101. After considering the three alternative locations, BART has proposed Alternative Site C for the following reasons:

- Alternative Site C is closer to the construction sites and thus requires a shorter access route to construction sites and less travel time for transport of equipment and materials.
- Alternative Site C avoids the need to displace the San Bruno Community Garden during the construction period which would be necessary if Alternative Site A were selected, and which the City of San Bruno has indicated is not acceptable.
- Alternative Site C avoids the dangers of working under, or in close proximity to, the PG&E high voltage transmission lines using cranes or hoists for lifting or moving various equipment and materials as would be the case if Alternative B was selected.

Alternative Site C does represent the worst-case scenario in terms of habitat disturbance when compared to the other two alternatives sites because in addition to disturbing the wetlands on the access route it would disturb an additional small amount of wetland habitat within the proposed site.

Alternative Site C is approximately 3.0 acres in area and would be located in the undeveloped upland area west of Highway 101, just south of the Cupid Row Canal and just east of the existing CalTrain tracks and proposed BART mainline alignment. Access to this yard and staging area would be via a new, temporary road running east from the site along the south side of the Community Gardens. The access road would then continue north along an existing dirt road through a section of the west-of-Bayshore parcel toward the existing PG&E substation. Turning east, the road would then connect to an existing Caltrans collector-distributor road along the westerly side of Highway 101 which is tied to the San Bruno Avenue Interchange. Caltrans will have to approve this connection to the San Bruno collector/distributor road. The existing collector-distributor road has enough area along the west side to allow for the construction of temporary deceleration and acceleration lanes required for supply trucks and safe merging with other Highway 101 traffic.

Construction Truck Traffic Volume. The volume of construction truck traffic was estimated based upon the quantities of required construction materials and other activities contained in Appendix B of the *Construction Scenario Report*. Truck activity includes removal of brush, trees and excess excavated earth; delivery of ready-mix concrete, reinforcing steel, and other construction materials; and delivery of ballast ties, rail and other railway construction materials.

This volume covers all truck activity to and from the San Bruno temporary storage yard and staging area. The estimated total volume of truck traffic in and out of this area is approximately 14,400 trips over the 45-month construction period. The majority of this traffic will take place over a shorter, 24 month period, when the bulk of the excavation and structural construction will take place. The proposed truck access route to the storage yard and staging area is presented in Figure 2-17.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Sacramento Field Office
2800 Cottage Way, Room E-1803
Sacramento, California 95825

IN REPLY REFER TO:

In Reply Refer To:
1-1-95-TA-1153

May 2, 1996

Mr. Stewart F. Taylor
Regional Administrator
U.S. Department of Transportation
Federal Transit Administration
Region IX
201 Mission Street
San Francisco, California 94105-1800

Subject: Request for Clarification of Specific Measures Included in the BART San Francisco Airport Extension Mitigation Package

On February 23, 1996, the U.S. Fish and Wildlife Service (Service) sent a letter to your office requesting clarification on certain aspects of the Final Biological Assessment for the BART San Francisco Airport Extension that appeared to conflict with measures agreed to during the consultation process. A meeting was then held with members of BART on March 13, 1996, to discuss the Service's concerns, and a letter of clarification was then sent to the Service, from BART, on April 16, 1996. On April 30, 1996, the Service met with BART representatives to discuss the adequacy of the clarification letter. In addition, BART provided a review of the project as proposed, its impacts, and the proposed mitigation, as well as an overview of existing documentation.

During the April 30 meeting, the Service expressed concern over the lack of commitment by BART to implement some of the agreed upon mitigation measures. Without an ability or commitment to implement mitigation measures, the Service must, unfortunately, consider them absent from the mitigation package. BART representatives expressed a desire and willingness at the meeting to comply with the elements of the mitigation proposal and requested the Service articulate our requirements. These requirements are that (1) BART will implement the five enhancement measures that are planned for the West-of Bayshore parcel, (2) given the difficulty of finding other suitable sites BART shall proceed with the purchase of Steele Ranch, and (3) wetland creation will be implemented on the west side of the CalTrain tracks.

The five enhancement measures involving the West-of-Bayshore parcel have been proposed by the FTA; however, implementation of these measures is contingent on final approval by the San Francisco International Airport (Airport). The Airports Commission has approved the measures "in concept" but BART has not received written authorization to proceed with these measures. The Service is requesting that BART provide all written commitments and documentation necessary to implement these mitigation measures, or that BART commits to measures of equal value to the species to be agreed upon by the Service.

One of the options for off-site compensation being considered by the FTA is the purchase of Steele Ranch, in southern coastal San Mateo County, and creation of an account to provide an endowment for maintenance of the property. The Service is requesting a written commitment from BART to purchase this property and to provide an endowment as described in the April 16, 1996 letter to our office from BART. Such a commitment should include a contingency commitment to acquire an alternate parcel, to be approved by the Service, should the purchase of Steele Ranch not occur. Under the contingency commitment BART should commit to the creation and compensation ratios agreed during the consultation process (off-site creation had been waived for Steele Ranch due to the size and location of the property). The agreed upon ratios for permanent impacts are creation of 5 acres of wetlands for every one acre of wetland impacted if creation occurs off-site, and creation of 3 acres of wetlands for every one acre of wetland if creation occurs on-site. For wetland impacts considered temporary, wetland creation off-site will occur at a 3:1 ratio and creation on-site will occur at a 2:1 ratio. Upland habitat will be compensated by preservation of 3 acres of surrounding uplands for every one acre of wetland.

Creation of wetlands west of the CalTrain tracks within an area approximately 50 feet wide and 1000 feet long in the vicinity of Santa Helena and San Antonio Avenues is proposed in the April 19, 1996 letter. The Service is requesting a firm commitment to create wetlands in this area. The Service understands that, at this time, BART is unable to determine the exact amount of creation that can occur within this area. Therefore, it would be appropriate for the FTA to commit to creation of wetlands at this location but to include a statement that the exact amount of wetlands to be created will not be known until a final design is approved by the Service. However, the size of the wetlands is expected to be between 0.6 and 1.0 acre. BART should commit to quantity and quality of water to support the California red-legged frog and to completing the creation component prior to disturbance. The details of meeting this commitment may be worked out at a future time.

Also, the Service has consistently recommended that the carwash be relocated to an area outside of the West-of-Bayshore parcel and is pleased that this request has been honored by the FTA. The Service believes that it is reasonable and feasible to relocate the carwash to the rail storage yard at the south end of the line in Burlingame.

These measures are considered to be the most important outstanding issues by the Service and will need to be addressed before our Biological Opinion can be issued. BART has requested the Service to provide a final Biological Opinion by May 16, 1996 so that commitments made to other agencies with regard to the project schedule can be kept. If the Service receives a response from the FTA on these issues no later than May 10, 1996, the Service will make every attempt to accommodate that time frame. The Service and BART have scheduled another meeting for Monday May 6, 1996 and anticipate resolution of any minor issues at that time.

Please contact Ms. Kelly Geer of my staff at (916) 979-2725, if you have questions regarding this response.

Sincerely,

Joel A. Medlin
Field Supervisor

cc: ARD, Klamath and California Ecoregions, Region 1, Portland, OR
Ms. Karita Zimmerman, BART
Carl Wilcox, CDFG, Yountville
Wetlands Branch

BART
BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street - Lake Merritt Station
P.O. Box 12688
Oakland, CA 94604-2688
Telephone (510) 464-6000

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PRESIDENT

MARGARET K. PRYOR
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6TH DISTRICT

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7TH DISTRICT

JAMES FANG
8TH DISTRICT

MICHAEL BERNICK
9TH DISTRICT

May 10, 1996

Mr. Joel A. Medlin
Field Supervisor
US Department of the Interior Coordinator
2800 Cottage Way, Room E-1803
Sacramento, California 95825

Dear Mr. Medlin:

Thank you for your interest in the BART-SFO Extension Project and for coordination with your staff on the Biological Assessment for Project activities on the west-of-Bayshore Parcel. Per the January 27, 1995 letter from Stuart Taylor, former Regional Administrator for the Federal Transit Administration (FTA) to Alison Willy of the US Fish and Wildlife Service (Service), BART is corresponding with the Service on behalf of the FTA with regard to the BART-San Francisco Airport Extension. As was requested at the May 2 meeting with my staff and the Service, I am affirming BART's commitment to implement the mitigation measures for the Project on the west-of-Bayshore parcel as outlined in our Biological Assessment (January 1996) and in our clarification letter of April 16, 1996.

Should the proposed project be adopted, BART will implement the following mitigation:

1. Implementation of five enhancement measures on the west-of-Bayshore Parcel described in the Biological Assessment (January 1996) including:
    - hydrologic study of the west-of-Bayshore parcel
    - bull frog abatement program
    - alteration of two culverts to extend duration of ponding in two seasonal wetlands
    - Cupid Row Canal tidal gate management
    - captive feeding program for the San Francisco garter snake

Implementation of these measures is contingent upon final approval by the Airport. Such approval is being sought. See the attached letter of May 10, 1996 to John Martin, Director of Airports. We recognize your concern about obtaining the Airport's final commitment to these measures and we fully expect to obtain this commitment in the near future. However, we are willing to immediately explore with the Service alternative measures of equal value to the species which could be implemented in the unlikely event that the Airport's final approval is not forthcoming.

2. Purchase of off-site known habitat of the San Francisco Garter Snake at the Steele Ranch parcel or a comparable parcel and establishment of an endowment for maintenance of the habitat.

   An option agreement and purchase and sale agreement for real property related to Steele Ranch is currently being negotiated between BART/SamTrans and the California Coastal Conservancy and negotiations are anticipated to close the end of May, 1996. A principal condition agreed to by both parties in the option is a provision that could extend the option past the initial expiration date of December 31, 1996. BART/SamTrans would purchase Steele Ranch following a Record of Decision issued by the Federal Transit Administration. This is anticipated in August, 1996.

   If for any reason Steele Ranch could not be purchased, BART will acquire an alternate parcel to be approved by the Service, as specified in the Service's May 2, 1996 letter to the FTA.

3. Creation of wetland habitat (0.6 to 1.0 acres) west of the Caltrain tracks which shall be provided with sufficient quantity and quality of water to support the red-legged frog and to be approved by the Service.

BART is looking forward to the Service's issuance of the Biological Opinion on May 16, 1996. If you have other questions please do not hesitate to call Ms. Kathleen Pahl, SFO Planning Manager at (510) 287-4858.

Very Truly Yours,

Richard A. White
General Manager

BART
BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street - Lake Merritt Station
P.O. Box 12688
Oakland, CA 94604-2688
Telephone (510) 464-6000

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8TH DISTRICT

MICHAEL BERNICK
9TH DISTRICT

May 10, 1996

Mr. John Martin
Director of Airports
City and County of San Francisco
San Francisco International Airport
P.O. Box 8097
San Francisco, California 94128

Dear Mr. Martin:

Attached is a letter from the U.S. Fish and Wildlife Service to the FTA requesting from BART confirmation that the San Francisco International Airport will allow BART to implement the following five(5) short-term enhancement measures on the west-of-Bayshore parcel as part of the BART-SFO Extension Project's Mitigation for Endangered Species:

- Hydrologic study of the west-of-Bayshore parcel;
- Bull frog Abatement program;
- Alteration of two culverts to extend duration of ponding in two seasonal wetlands;
- Cupid Row Canal tidal gate management; and
- Captive feeding program for the San Francisco Garter snake.

These five short-term enhancement measures were approved conceptually by the Airports Commission on November 21, 1995. Please concur that the Airport is committed to allowing BART to implement these mitigations by providing a response letter. Attached is a sample response letter.

The U.S. Fish and Wildlife Service requested on May 3, 1996, that a letter confirming the Airport's commitment be submitted to the Service by May 10, 1996 in order to issue the Biological Opinion on May 16, 1996. Your prompt attention to this letter is greatly appreciated.

Sincerely,

Richard A. White
General Manager

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Sacramento Field Office
2800 Cottage Way, Room E-1803
Sacramento, California 95825

IN REPLY REFER TO:

MAY 22 1996

In Reply Refer To:
1-1-96-F-86

May 20, 1996

Mr. Leslie Rogers
Regional Administrator
U.S. Department of Transportation
Federal Transit Administration
Region IX
201 Mission Street
San Francisco, California 94105-1800

Subject: Formal Consultation and Conference on the Bay Area Rapid Transit District San Francisco Airport Extension, Cities of Millbrae and Burlingame, San Mateo County, California

Dear Mr. Rogers:

This is in response to the Federal Transit Administrations (FTA) request for formal consultation on the effects of the Bay Area Rapid Transit District (BART) San Francisco Airport Extension, San Mateo County, California, on the San Francisco garter snake (*Thamnophis sirtalis tetrataenia*). This document represents the Service's biological opinion on the effects of the action on the endangered San Francisco garter snake and incorporates a conference opinion prepared pursuant to 50 CFR §402.10, which addresses project effects on the proposed endangered California red-legged frog (*Rana aurora draytonii*). The Service is listing the California red-legged frog as threatened on May 23, 1996 and may adopt this conference opinion as the biological opinion for the proposed work at that time.

The following information was considered in our analysis of effects to these species:

(1) The Biological Assessment (BA) for the project, which we received on January 26, 1996;

(2) Project maps and supplemental information provided in numerous meetings, telephone conversations, and correspondence between members of my staff, the FTA and/or BART;

(3) Three site visits by members of my staff;

(4) Published information concerning the status and ecology of the red-legged frog and the San Francisco garter snake

(5) Unpublished information in U.S. Fish and Wildlife Service files.

Consultation History

In 1993 the U.S. Fish and Wildlife Service (Service) and BART began informal consultation on the proposed San Francisco Airport light-rail extension. The purpose of this informal consultation was to reduce the likelihood of conflicts between listed and proposed species and the proposed action before formal consultation was initiated. During the informal consultation process, the proposed project design changed on several occasions. Several meetings were held to discuss project design changes, to evaluate the possible impacts to the San Francisco garter snake and the California red-legged frog, and to decide appropriate methods to minimize and mitigate for impacts to these species.

Initiation of formal consultation was originally requested by the FTA on January 27, 1995. At that time, the FTA also authorized BART to act on the FTAs behalf in assuring that the FTAs responsibilities under section 7 of the Endangered Species Act of 1973, as amended (ACT) were fulfilled. On April 28, 1995, the U.S. Fish and Wildlife Service (Service) requested an extension of formal consultation until a Biological Assessment (BA) for the project was completed. On June 23, 1995, the Service received a letter from BART agreeing to extend formal consultation until the Service received the BA.

On January 26, 1996, the Service received the final BART San Francisco Airport Extension Project Biological Assessment (BA) for the San Francisco Garter Snake and the California red-legged frog. At that time, formal consultation was initiated. On February 23, 1996, the Service sent a letter to the FTA requesting clarification on the certain aspects of the BA. A meeting between BART and the Service was held on March 13, 1996, and the outstanding issues, mentioned in the Service's February letter, were discussed. On April 16, 1996, the Service received a clarification letter from BART. A follow-up meeting was held on April 24, 1996. During this meeting, the Service and BART discussed certain issues that the Service felt still had not been adequately addressed. At that time, BART requested a letter from the Service outlining these issues and requesting a written response. The Service provided this letter to the FTA on May 2, 1996. A response letter was provided to the Service on May 10, 1996. A final (revised) version of the BARTs response letter was provided to the Service on May 14, 1996.

BIOLOGICAL/CONFERENCE OPINION

Description of the Proposed Action

Project Overview

The proposed action is extension of the BART light rail from the proposed Colma and Millbrae stations to the San Francisco International Airport (SFIA). The project corridor is located in northern San Mateo County and extends approximately eight miles from an unincorporated area of the Town of Colma to the southern terminus of the existing BART tracks in Burlingame. The corridor extends south through the Town of Colma and the cities of South San Francisco, San Bruno, a small portion of unincorporated San Mateo County owned by SFIA (west-of-Bayshore), the City of Millbrae, and the northern portion of the City of Burlingame. Although the project is eight miles long, there is only one portion of the corridor that supports Federally listed or proposed species. This is the 180 acre west-of-Bayshore parcel which is located west of Highway 101 (Old Bayshore Highway) and is owned by the SFIA. This parcel of land supports the Federally listed endangered San Francisco garter snake and the California red-legged frog.

Except for the segment between Angus Avenue in San Bruno and the Millbrae Avenue Station tailtracks in Burlingame, which includes the segment adjacent to and through the west-of-Bayshore parcel, the majority of the BART extension will be in tunneled subway. The portion of the BART extension that will bisect the west-of Bayshore parcel will be an aerial wye stub which will be perpendicular to the CalTrain mainline and will terminate at the planned SFIA International Terminal. The north and south legs of the aerial wye will ascend from the mainline and curve east on aerial structures over the SFIA west-of-Bayshore parcel. The aerial structure will then cross Highway 101 and join to form one structure before connecting to the SFIA International Terminal.

Construction activities that are likely to adversely affect the San Francisco garter snake and California red-legged frog will include a geotechnical field investigation, raising of PG&E powerlines, construction of a temporary trestle bridge, construction of the portion of the mainline adjacent to the west-of-Bayshore parcel, construction of the aerial wye stubs, relocation of a 12 kV underground power feed, and construction or improvement of temporary roads.

The purpose of the geotechnical field investigation is to obtain data on soils and ground-water levels on the west-of Bayshore parcel. The initial first phase of the geotechnical investigation included 37 test sites that were not likely to adversely affect the San Francisco garter snake and California red-legged frog and were authorized by the Service in a January 19, 1996, letter. The remaining eight test locations were determined by the Service to likely adversely affect the species and were postponed until the second phase of the Field Investigation Program and are included in this formal consultation.

In order for the BART aerial structure to clear the existing elevated Airport ramps it must cross through the location of existing PG&E transmission lines. PG&E will have to raise the transmission lines above the aerial structure by erecting five or six new tubular steel poles adjacent to the proposed BART supporting columns for the aerial structures. Because the transmission lines are the primary source of electric power to the north peninsula area and the City of San Francisco, construction on these lines will allow only one of six circuits to be temporarily taken out of service at any given time. Therefore, a temporary wood pole shoo-fly or by-pass line will have to be constructed to carry circuits until the work on the affected lines is completed. Installation of the new tubular towers will impact a wetland area which occurs between the two aerial wye stubs. In addition, access to the construction area will be via an existing dirt road which will be converted to an all-weather road for the duration of the PG&E construction period.

Cut-and-cover subway construction is planned to occur at the north and south ends of the west-of-Bayshore parcel. A typical cut-and-cover subway section will be 10 feet below the surface, in order to accommodate underground utilities and landscaping. A retained cut section will occur at the transition points between the cut-and-cover subway sections and the retained fill above-ground section. Construction of the retained cut transition section is similar to that of the cut-and-cover subway section, except there is no top slab thus allowing the rail line to transition from subway to ground level. The above-ground retained fill section will occur along the majority of the western boundary of the west-of-Bayshore parcel. In retained fill sections small to medium height reinforced concrete walls are used to "retain" the fill material used to elevate the tracks higher than the existing grade. The aerial wye stubs, which will cross the west-of-Bayshore parcel, will split off of this retained fill section. Construction of the mainline alignment will require fill of a portion of two seasonal wetlands along San Felipe Canal.

BART will provide access along the aerial wye stub construction corridor on a 40-foot wide temporary trestle bridge. All aerial wye stub construction activity will be done from the trestle bridge. The temporary trestle bridges (one for each wye-stub leg) and the aerial wye stubs will be elevated on pilings to allow free movement of water and wildlife underneath.

A temporary storage yard and staging area will be provided in an undeveloped area west of Highway 101, just south of the Cupid Row Canal and just east of the mainline alignment on the west-of-Bayshore parcel. Access to this yard and staging area will be via a new, temporary road running east from the site along the south side of the Community Gardens. The access road will then continue north along an existing dirt road through a section of the west-of-Bayshore parcel toward the existing PG&E substation. Turning east, the road will then connect to an existing Caltrans collector-distributor road along the westerly side of Highway 101 which is tied to the San Bruno collector/distributor road. A portion of the existing dirt road will be converted to an all-weather surface for the entire construction period.

An existing 12 kV underground power feed from the west-of-Bayshore parcel to the SFIA will be impacted by the footings for the aerial wye stub. The power line will be relocated to a point a few hundred feet north of the existing crossing where an existing manhole occurs. The new underground crossing will be installed by directionally drilling from a pit next to the existing manhole to a new manhole which will be located on the east side of Highway 101.

BART has estimated potential impacts to San Francisco garter snake habitat from the proposed project to include: 0.343 acres of temporary wetland impacts; 1.618 acres of permanent wetland impacts; 1.15 acres of temporary upland impacts; and, between 9.11 and 10.54 acres of permanent upland impacts. BART has defined temporary impacts to include construction related disturbances of short duration (6 months or less) upon wetland habitat and upland habitat that does not support San Francisco garter snake hibernacula (as indicated by burrows and/or coyote brush (*Baccharis pilularis*). Permanent impacts are construction related disturbance of a long duration (greater than 6 months) to wetlands and/or uplands that do not support San Francisco garter snake hibernacula and impacts of any duration to uplands that do support San Francisco garter snake hibernacula.

Proposed Mitigation

Construction of the aerial wye stubs will be conducted from temporary trestle bridges. By elevating the construction area above ground, water and wildlife will be able to move freely throughout the majority of the west-of-Bayshore parcel. In addition, by elevating the construction area impacts to the majority of the most densely occupied habitat will be avoided.

Preconstruction and construction sites will be fenced for at least a six week period prior to any construction activity and must occur between March and the first of October. If there is not enough time before activity begins in an area to fulfill the above fencing requirement, then the site will not only be fenced, but also will be watered with a sprinkling system. Watering will occur twice. On day one, the area will be watered with 2 to 3 inches of water for one evening. One week after the initial watering, a second watering will occur with 1 to 2 inches of water for one evening. In both instances, surface ponding will be avoided. The purpose of watering is to saturate the soils and drive snakes to the surface where they can exit or be removed from the construction area. Fencing will remain in place after installation and throughout the construction period except in the case of the aerial wye stub where fencing will be removed after the trestle is completed but before construction of the aerial wye stub begins. The only fencing that will be in place in the aerial wye stub construction zone will be at those points where the aerial wye stub footings will be placed.

The construction site will be surveyed by a monitoring biologist(s). The monitoring biologist will insure that all construction related mitigation measures are in place and effective and will remove all San Francisco garter snakes found in the construction area before construction activities will be allowed to proceed. The monitoring biologist will also educate the crews on the sensitivity and identification of the San Francisco garter snake and the California red-legged frog and the penalties for taking the snake. In addition, visual materials will be provided to assist in identifying the species. A Biological Monitoring Plan will be developed and approved by the Service and the California Department of Fish and Game. A Service approved plan also will be developed and implemented by the BART that will include a revegetation program and suitable soil erosion control measures.

Five enhancement measures on the west-of-Bayshore parcel will be implemented. These five enhancement measures are described in detail in the January 1996 BA and include:

1. Study to characterize the water regimes on the west-of-Bayshore parcel: BART will conduct a geotechnical field investigation (hydrologic study) of the entire 180 acre west-of-Bayshore parcel. This study is intended to help define surface and ground water movement and water ponding regimes for the various wetlands and waterbodies on west-of-Bayshore and to assist BART in developing on-site mitigation measures numbers 2 and 3 as described below.

2. Alteration of culverts to seasonal wetlands at the southern end of the west-of-Bayshore parcel: The goal of this measure is to improve the habitat values of these seasonal wetlands for the California red-legged frog by allowing water to pond for a longer period of time. BART will develop and implement design modifications to the culverts using information collected during the hydrologic study. BART will also monitor the seasonal wetlands after alterations occur to determine the success of the habitat enhancement. The monitoring efforts will extend for a minimum of five years. Should the monitoring results indicate that the modified culverts are not meeting success criteria established by BART and the Service, BART will extend the monitoring effort or reinitiate section 7 consultation with the Service. BART will be responsible for maintenance of the culverts for twenty years.

3) Management of Cupid Row Canal Tidal Gates: Past management of these tidal gates has caused an increase in the salinity within the Cupids Row Canal and thus a decrease in suitable habitat for the California red-legged frog. BART will use information collected during the hydrologic study to design and implement a Service approved management program for the Cupid Row Canal tidal gates. BART will monitor the development of freshwater habitats and the California red-legged frog population along the canal for a minimum of five years to determine the success of the habitat enhancement. Should the monitoring results indicate that the selected tide gate management program is not meeting success criteria established by BART and the Service, BART will extend the monitoring effort or reinitiate section 7 consultation with the Service. BART will be responsible for managing the tide gates for 20 years.

4) Bullfrog Abatement Program: The goal of this measure is to eliminate or significantly reduce the population of bullfrogs on the west-of-Bayshore parcel. A variety of methods will be used and monitored in a three year pilot study. Those methods or combination of methods that are considered the most successful will then be implemented for an additional 17 years.

5) San Francisco Garter Snake Capture Feeding Program: The goal of this measure is to promote successful maturation of young San Francisco garter snakes and survival of adults by removing them from the construction area for the duration of construction activities on the west-of-Bayshore parcel. BART will define further details and develop a final scope of work for this program with the Service prior to initiation of the program.

Bart will purchase Steele Ranch, a 244 acre parcel of land in the southwestern portion of San Mateo County, where there is an existing San Francisco garter snake population. Point Año Nuevo State Preserve, which is maintained by the California Department of Parks and Recreation, could potentially manage Steele Ranch. If for any reason Steele Ranch can not be purchased, BART will acquire an alternate parcel, to be approved by the Service, and will commit to creation and compensation at the following ratios: creation of 5 acres of wetlands for every one acre of wetland permanently impacted, if creation occurs off-site; or creation of 3 acres of wetlands for every one acre of wetland permanently impacted, if creation occurs on-site; and creation of 3 acres of wetlands for every one acre temporarily impacted, if creation occurs off-site; or creation of 2 acres of wetlands for every one acre temporarily impacted if creation will occur on-site. Impacts to upland habitat will be compensated for by preservation of 3 acres of surrounding uplands for every one acre of wetland created or preserved. On-site creation is defined as any creation that occurs on or adjacent to the west-of-Bayshore parcel. An endowment for maintenance of this habitat will be established that will provide approximately $50,000 per year.

BART will create between 0.6 and 1.0 acre of wetlands west of the CalTrain tracks in the vicinity of Santa Helena and San Antonio Avenues and will provide water of sufficient quantity and quality to support the California red-legged frog. Final design of the wetlands will be approved by the Service.

Status of the Species

San Francisco garter snake

The San Francisco garter snake was listed as a Federal endangered species in March, 1967 (32 FR 4001). The San Francisco garter snake is an extremely colorful snake. It is identified by its burnt orange head, yellow to greenish-yellow dorsal stripe edged in black, and its red lateral stripe which may be continuous or broken with black blotches and edged in black. The belly color varies from greenish-blue to blue. Large adults can reach three feet in length.

The San Francisco garter snakes preferred habitat is a densely vegetated pond near an open hillside where it can sun itself, feed, and find cover in rodent burrows. The snakes are extremely shy, difficult to locate and capture, and quick to flee to water or cover when disturbed (Willy, pers. comm.). Adult snakes may estivate in rodent burrows during summer months when ponds may dry. On the coast snakes hibernate during the winter, but further inland, if the weather is suitable, snakes may be active year round.

San Francisco garter snakes breed in the spring or late fall (Larsen, pers. comm.) and bear live young from May through October (Stebbins 1985). The average litter size is 12-18 (Stebbins 1985). Many species of snakes, including garter snakes, breed adjacent to their hibernacula. Although highly vagile, adults spend considerable time after emergence in their hibernacula.

Although primarily a diurnal species, captive snakes housed in an outside enclosure were observed foraging after dark on warm evenings (Larsen, pers. comm.). Adult snakes feed primarily on California red-legged frogs, and may also feed on juvenile bullfrogs (*Rana catesbeiana*). In laboratory studies, Larsen (1994) fed adult San Francisco garter snakes two year old bullfrog tadpoles and found that only the largest adults could eat and digest the tadpoles; smaller adults regurgitated partially digested tadpoles, apparently unable to fully digest them. Larsen (1994) also found that when these smaller adult snakes were fed bullfrogs and California red-legged frogs of comparable size, they were unable to hold and eat the bullfrogs although they had no trouble with the California red-legged frogs. Newborn and juvenile San Francisco garter snakes depend heavily upon Pacific treefrogs (*Hyla regilla*) as prey (Larsen 1994). If newly metamorphosed Pacific treefrogs are not available, the young snakes may not survive.

Many of the threats that led to the listing of the San Francisco garter snake in 1967 (32 Federal Register 4001) continued to impact the species in 1985 when the Recovery Plan was written. These included loss of habitat from agricultural, commercial and urban development and collection by "reptile fanciers and breeders" (Service 1985).

The historical threats to the species remain, but there are now additional threats to the species, such as the documented decline of the California red-legged frog (an essential prey species) and the introduction of bullfrogs (*Rana catesbeiana*) into San Francisco garter snake habitat. Bullfrogs are capable of preying on both San Francisco garter snakes and California red-legged frogs. Extirpation of California red-legged frogs in San Francisco garter snake habitat is likely to cause a local extinction event for the snake.

The Recovery Plan for the San Francisco garter snake (Service 1985) identified six significant populations. These were the Airport (west-of-Bayshore), San Francisco State Fish and Game Refuge (Refuge), Laguna Salada (Pacifica), Pescadero Marsh Natural Preserve (Pescadero) and Año Nuevo State Reserve (Año Nuevo) populations, and an isolated population fragment north of Half Moon Bay. Of the six populations known in 1985, the Pacifica population was heavily impacted in 1989 and is no longer considered significant, four have declined drastically (Airport, Refuge, Pescadero and Año Nuevo). The status of the Half Moon Bay population is unknown.

Of the declining populations, the Año Nuevo population appears to have the slowest rate of decline. Recent recovery actions at Año Nuevo may be further slowing the decline of that population. Current land management practices outside of State park lands are impacting the Año Nuevo population. Steele Ranch, a 244 acre parcel currently in agriculture, is one of the areas adjacent to Año Nuevo State Park that is impacting the Año Nuevo population. It is unknown whether or not recovery efforts made by the California State Parks will be sufficient to change the trend in that population.

The Refuge population is found on San Francisco Water Department lands in the area encompassing the Upper and Lower Crystal Springs and San Andreas Reservoirs. This population is highly dispersed and is heavily impacted from predation by introduced fishes, reservoir fluctuations and dewatering, and bullfrogs.

The most significant declines in population numbers of San Francisco garter snakes (apart from Pacifica) is the decline of the Airport population. Data on this population has shown a dramatic downward trend in numbers over the past several years. Larsen (1994) censused the population between 1990 and 1992 and detected a population decline greater than 70 percent from the 1983 to 1985 population census completed by Wharton (1989). No detections were made in six site visits made by the Service from November 1994 to present, except for one paralyzed male.

California red-legged frog

The California red-legged frog (red-legged frog) was proposed as endangered on February 2, 1994 (59 FR 4888). On May 23, 1996 the California red-legged frog will be listed as threatened. The California red-legged frog is the largest native frog in the western United States (Wright and Wright 1949), ranging from 4 to 13 centimeters (1.5 to 5.1 inches) in length (Stebbins 1985). The abdomen and hind legs of adults are largely red; the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 1985). Dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 14 to 80 millimeters (mm) (0.6 to 3.1 inches) in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

California red-legged frogs have paired vocal sacs and call in air (Hayes and Krempels 1986). Female California red-legged frogs deposit egg masses on emergent vegetation so that the egg mass floats on the surface of the water (Hayes and Miyamoto 1984). California red-legged frogs breed from November through March with earlier breeding records occurring in southern localities (Storer 1925). California red-legged frogs found in coastal drainages are rarely inactive (Jennings *et al.* 1992), whereas those found in interior sites may hibernate (Storer 1925).

The California red-legged frog occupies a fairly distinct habitat, combining both specific aquatic and riparian components (Hayes and Jennings 1988, Jennings 1988b). The adults require dense, shrubby or emergent riparian vegetation closely associated with deep (>0.7 meters) still or slow moving water (Hayes and Jennings 1988). The largest densities of California red-legged frogs currently are associated with deep-water pools with dense stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha latifolia*) (Jennings 1988b). Well-vegetated terrestrial areas within the riparian corridor may provide important sheltering habitat during winter. California red-legged frogs estivate in small mammal burrows and moist leaf litter. California red-legged frogs have been found greater than one mile from breeding habitat (permanent water) (Mike Westphal, pers. comm.) and may estivate up to 300 feet from breeding habitat (Galen Rathbun, pers. com., Willy, pers. comm.).

Egg masses that contain about 2,000 to 5,000 moderate-sized (2.0 to 2.8 mm (0.08 to 0.11 inches) in diameter), dark reddish brown eggs are typically attached to vertical emergent vegetation, such as bulrushes (*Scirpus* spp.) or cattail (*Typha* spp.) (Jennings *et al.* 1992). Red-legged frogs are often explosive breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Eggs hatch in 6 to 14 days (Jennings 1988b). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992). One hundred percent mortality occurs in eggs exposed to salinity levels greater than 4.5 parts per thousand (Jennings and Hayes 1990). Increased siltation that occurs during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3.5 to 7 months after hatching (Storer 1925, Wright and Wright 1949, Jennings and Hayes 1990). Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). Sexual maturity normally is reached at 3 to 4 years of age (Storer 1925, Jennings and Hayes 1985). California red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992).

The diet of California red-legged frogs is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food items. Vertebrates, such as Pacific tree frogs and California mice (*Peromyscus californicus*), represented over half of the prey mass eaten by larger frogs (Hayes and Tennant 1985). Hayes and Tennant (1985) found juvenile frogs to be active diurnally and nocturnally, whereas adult frogs were largely nocturnal. Feeding activity probably occurs along the shoreline and on the surface of the water (Hayes and Tennant 1985). Larvae likely eat algae (Jennings *et al.* 1992).

The California red-legged frog has been extirpated from 70 percent of its former range and is threatened throughout its remaining range by a wide variety of human impacts including urban encroachment, construction of reservoirs and water diversions, and introduction of predators and competitors. It is found in streams and ponds with dense emergent vegetation such as tules and cattails along the shoreline. Historically, this species was found throughout the Central Valley and Sierra Nevada foothills. For descriptions of the biology, population status and trends, and past management of the California red-legged frog, consult the proposed rule (FR 59 4888) and the references cited therein.

Several researchers in Central California have noted the decline and eventual disappearance of California red-legged frog once bullfrogs become established at the same site (L. Hunt, *in litt.* 1993; S. Barry, *in litt.*, 1992; S. Sweet, *in litt.*1993.) Bullfrogs prey on California red-legged frogs (Twedt 1993; S. Sweet, *in litt.* 1993) and interfere with California red-legged frog reproduction (Jennings and Hayes 1990; Twedt 1993; M. Jennings, *in litt.* 1993; R. Stebbins *in litt.* 1993).

California red-legged frog population numbers are not precisely known, although the Service estimates that populations are declining throughout the range of the sub-species. There is not a recent scientific estimate on the rate of the decline, but many of the remaining populations appear to be declining at a rapid rate. Only three populations were thought to have more than 350 adult frogs when the species was proposed in 1994. Of those three populations, one is thought to remain intact, one has been reduced to low numbers, and one has declined to such an extent that detections are unlikely.

Environmental Baseline

The environmental baseline describes the effects of past and ongoing human and natural factors leading to the current status of the species covered by this consultation.

Only the west-of-Bayshore population is affected by this action. The site is currently transversed by power lines, and there are two transformer stations and one metering station on the site. The site has several dirt, gravel, and asphalt access roads leading to existing facilities. The Southern Pacific Railroad and SamTrans commuter tracks run along the western boundary of the Airport property.

The west-of-Bayshore San Francisco garter snake and California red-legged frog populations have shown a dramatic downward trend in numbers over the past several years. This decline in numbers can be primarily attributed to ongoing unmitigated impacts caused by site management activities. Modifications to foraging habitat and refugia from management activities such as canal clearing and fuels reduction impact these species.

Another recent factor which is affecting the California red-legged frog population on the project site is uncontrolled tidal influence. California red-legged frogs are intolerant of salinity (Jennings and Hayes 1990). The decline seen in the California red-legged frog and San Francisco garter snake populations at the Airport between 1985 and 1992 may have been caused by the occasionally inoperative tide gates to the property.

Several large drains are located in the north-central section of the west-of-Bayshore parcel. These drains are covered with grates to prevent people or dogs from falling in and becoming trapped. However, these drains act a permanent pit-traps for the snakes and California red-legged frogs which fall into the drains and are unable to escape or are flushed into unsuitable habitat.

Authorized and trespass vehicular traffic, including off-road vehicular traffic, is a serious problem at the west-of-Bayshore site and causes injury or death to the species through direct affects (such as running over an animal) or indirect effects (such as increased sedimentation). Neighborhood kids have been known to trespass on the west-of-Bayshore site and collect tadpoles, frogs, and snakes. Homeless people and runaways have occasionally set up camps on site. These residents camp in habitat, crush and cut vegetation in the habitat, and occasionally have pets which may harass or kill California red-legged frogs and San Francisco garter snakes.

Mosquito abatement activities have historically had negative impacts on wetlands that occur at the site and vehicles used to access the wetlands may kill or injure animals. However, the Service has coordinated with San Mateo County Mosquito Abatement District on measures that are not likely to cause take of San Francisco garter snakes or California red-legged frogs.

During the winter of 1990, Larsen (1994) observed bullfrogs and their tadpoles at the far southern end of South Lomita Canal. This was the first observation of bullfrogs on west-of-Bayshore. During 1991, bullfrogs were sighted throughout the entire canal, and a corresponding decline of California red-legged frogs was noted (Larsen 1994).

Effects of the Proposed Action

San Francisco garter snake

The San Francisco garter snake is likely to be adversely affected as a result of the proposed action. San Francisco garter snakes may be adversely affected by fill of wetland areas on the site or by excavation of wetland areas. Wetland areas at the west-of-Bayshore site include seasonal wetlands, seasonal drainages, canals, and associated vegetation. Removal of these areas causes a reduction in prey items, movement corridors, and basking and retreat areas.

It has been demonstrated that San Francisco garter snakes can become acclimated to high levels of human activity; however, the San Francisco garter snake is easily agitated by certain activities before becoming acclimated. Disturbance can occur as a result of actions in and adjacent to habitat that are above the ambient level. The Service views noise and movement above the ambient level of human activity as a possible form of harassment to individual snakes. Additionally, disturbance above ambient levels in and adjacent to habitat is likely to harm snakes by preventing them from foraging.

Dispersal of snakes may be inhibited by the project, as snakes may be discouraged from moving along established dispersal corridors. Additionally, snakes may move out of the protective cover of their dispersal corridor into unprotected habitat. This type of movement will make the snakes more susceptible to injury or mortality due to predation by bullfrogs and other predators, vehicular or foot traffic, or other construction and maintenance activities. Snakes that are displaced by construction activities or other forms of disturbance may be required to compete for food and living space with snakes in adjacent areas.

Hibernacula will be destroyed or degraded by construction related activities. San Francisco garter snakes may be harmed by the loss of hibernacula, because this habitat is needed for breeding and sheltering. Snakes may become trapped and die if the entrance to their hibernacula is crushed or covered.

Due to the low numbers of San Francisco garter snakes on the site, barriers to dispersal may limit breeding opportunities for snakes. San Francisco garter snakes are known to breed during the fall and spring, but there is no data on the peak breeding months. The noise and ground vibrations expected from the use of heavy equipment during grading and road construction activities, and the sound generated from construction of the mitigation ponds, may harass San Francisco garter snakes and affect reproductive activity and viability by disrupting breeding behavior.

Snakes may get inside of exclusion fencing and become trapped in, or disperse into, the construction area. Mitigation activities will necessitate the potential trapping or handling of San Francisco garter snakes. Trapping San

Francisco garter snakes may affect the survivability of individuals and the viability of the population.

San Francisco garter snakes are known to bask on dirt roads and to hide under vegetation when disturbed. This behavior makes the snakes susceptible to crushing. Snakes may be crushed from movement of vehicles and equipment on-site. Snakes seeking cover in rodent burrows may be killed during the excavation of the levee or the placement of fill in the stockpile area. Vehicular use of roads adjacent to habitat may result in San Francisco garter snakes being killed. San Francisco garter snakes may be killed by traffic on the access roads which transverse the site and by off-road travel on the site.

California red-legged frog

The California red-legged frog is likely to be affected in all life stages as a result of the proposed action. The California red-legged frog may be adversely affected by fill of wetland areas on the site. This loss of habitat is likely to subject California red-legged frogs to desiccation and expose them to avian and other predators when they disperse to find suitable habitat away from the pond. Harm is likely to be greatest in habitat loss that occurs prior to attainment of suitability of the mitigation ponds to support frogs. California red-legged frog larvae are likely to be killed from draining of this habitat.

Mitigation activities will necessitate the capturing, handling and potential trapping of California red-legged frog adults and larvae. Trapping or capturing frogs may affect the survivability of individuals and the viability of the population. Maintenance actions at the mitigation site such as pond dewatering, removal of undesirable plants and removal of emergent vegetation in the mitigation ponds are likely to harm and harass California red-legged frogs.

The noise and ground vibrations expected from the use of heavy equipment during grading and road construction activities, and the sound generated from construction of the mitigation ponds, may harass California red-legged frogs and affect reproductive activity and viability by disrupting breeding behavior. In addition, construction activities or other forms of disturbance may cause frogs to disburse. Frogs moving away from an activity area may be driven into the open where they are more susceptible to injury or mortality due to predation, vehicular or foot traffic, or other construction and maintenance activities. In addition, frogs that are displaced by construction activities or other forms of disturbance may be required to compete for food and living space with animals in adjacent areas.

Vehicular use of roads adjacent to habitat is likely to result in California red-legged frogs being killed. California red-legged frogs may be killed by traffic on the CalTrain tracks which separate the mitigation site from the west-of-Bayshore property and by traffic associated with construction activities.

Cumulative Effects

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this biological and conference opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section, because they require separate consultation pursuant to section 7 of the Act.

The site is private property and is the only property owned by the San Francisco Airport that may satisfy their future development needs. Certain activities associated with the proposed San Francisco Master Plan are likely to directly and/or indirectly affect the San Francisco garter snake west-of-

Bayshore population. These activities include highway 101 interchange modifications and roadway improvements adjacent to the west-of-Bayshore parcel and the addition of supplemental power and water lines which are expected to transverse the west-of-Bayshore parcel.

In addition, Caltrans is proposing to do a seismic retrofit of the southbound SFIA exit ramp to Highway 101 which is expected to impact upland and wetland San Francisco garter snake habitat at the west-of-Bayshore site. A proposed natural gas pipeline extension (Mojave pipeline) will impact an area east of the CalTrain tracks and west of west-of-Bayshore parcels western fenceline. The Mojave pipeline will contribute to the adverse indirect effects to the species at the west-of-Bayshore parcel.

Impacts to the west-of-Bayshore population described in the Environmental Baseline section of this document continue. These impacts include unmitigated impacts due to site maintenance activities, uncontrolled tidal influence, entrapment of snakes in drains, authorized and tresspass vehicular traffic, mosquito abatement activities and bullfrog predation.

Conclusion

After reviewing the current status of the San Francisco garter snake and the California red-legged frog; the environmental baseline for the action area; the effects of the proposed project; and the cumulative effects; the Service has determined that the proposed project, as described in this document, is not likely to jeopardize the continued existence of these species. No critical habitat has been designated or proposed for these species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act prohibits the taking of listed fish or wildlife species without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harass is defined as an intentional or negligent act or omission that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined as an act which actually kills or injures wildlife and is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Corps or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary. FTA must assure that they become binding conditions of any grant or permit issued to the BART, as appropriate, in order for the exemption in section 7(o)(2) to apply. The FTA has a continuing duty to regulate the activity covered by this incidental take statement. If the FTA (1) fails to require BART to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount and Extent of Take

The Service expects that incidental take of the San Francisco garter snake will be difficult to detect or quantify for the following reasons: The elusive nature of the organism and its moderately small body size make the finding of a dead specimen unlikely, losses may be masked by seasonal fluctuations in numbers or other causes, and the species occurs in habitat that makes it difficult to detect. Due to the difficulty in quantifying the number of San Francisco garter snakes that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as the number of acres of habitat that will become unsuitable for the species as a result of the action. In addition, the Service expects that incidental take of the California red-legged frog will be difficult to detect or quantify for the following reasons: The aquatic nature of the organism and its moderately small body size make the finding of a dead specimen unlikely, losses may be masked by seasonal fluctuations in numbers or other causes, and the species occurs in habitat that makes it difficult to detect. Due to the difficulty in quantifying the number of California red-legged frogs that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as the number of acres of habitat that will become unsuitable for the species as a result of the action.

Therefore, the Service estimates that 12.5 acres of San Francisco garter snake and California red-legged frog habitat will become unsuitable as a result of the proposed action. The Service has developed the following incidental take statement based on the premise that the reasonable and prudent measures will be implemented. Upon implementation of the following reasonable and prudent measures 12.5 acres of habitat will become exempt from the prohibitions described under section 9 of the Act for direct impacts, and 180 acres of mitigation habitat will be exempt from the prohibitions described under section 9 of the Act for indirect impacts associated with the proposed project.

Effect of the Take

In the accompanying biological opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy to the species, due to the potential benefits of some of the mitigation measures agreed to.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the impacts of the project on the San Francisco garter snake and the California red-legged frog.

1. The FTA shall minimize the likelihood of direct loss of San Francisco garter snakes.

2. The FTA shall minimize the likelihood of harming San Francisco garter snakes.

3. The FTA shall minimize impacts of habitat modification or loss to the San Francisco garter snake.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the FTA must ensure that the BART complies with the following terms and conditions, which implement the reasonable and prudent measures described above.

1. To implement Reasonable and Prudent Measure number one the FTA shall ensure the following:

(a) That exclosure and drift fencing is constructed in accordance with Service-approved protocol.

(b) That funnel traps used to trap San Francisco garter snakes are constructed following a Service-provided prototype and set appropriately to maximize trapping success.

(c) That exclosure fences around the construction areas are placed in such a manner as to maximize trapping success.

(d) That exclosure and drift fences are inspected daily and if needed, repairs are performed.

(e) That exclosure fences are placed around any construction area, including mitigation areas, for a six-week period prior any construction action.

(f) That once exlosure fencing is in place, it is maintained until completion of construction within the exclosure.

(g) That any surface construction that is to occur between October 1 and March 15 of any year will have snake exclosure fencing in place no later than September 1. This will be maintained from of the time of placement of the exclosure fencing until completion of construction within the exclosure.

(h) That the Service is contacted in the event of any repairs to exclosure fences, and that the six-week exclusionary period is reinvoked, if it is determined by the Service that the exclusion fence was not functioning prior to repairs.

(i) That the boring for the 12 kV feed is accomplished from the east side of Highway 101.

(j) That the 12 kV feed receiving area is not cleared of vegetation.

(k) That any individuals handling San Francisco garter snakes (or the California red-legged frog, should it become listed) hold a valid 10(a)(1)(A) Scientific Collection Permit from the Service.

(l) That trapped and bagged San Francisco garter snakes are transported directly to the captive holding institution selected, or transferred directly to the Service's Sacramento Field Office Division of Endangered Species.

(m) That the monitoring biologist(s) does not open the snake traps, unless otherwise approved or unless animals that may injure the San Francisco garter snakes are in the traps. Other animals, except bullfrogs shall be released on-site.

(n) That San Francisco garter snakes trapped on-site are not removed from the trap, that the trap is placed in a large white cotton bag constructed of material that is no heavier than percale sheeting, and that the bags is secured properly and placed in full shade until the end of the work day.

(o) That the Service's Sacramento Field Office Division of Endangered Species is contacted at (916)979-2725 within 30 minutes of capture of a San Francisco garter snake. If contact of this office cannot be made within 60 minutes of capture, then a Special Agent with the Service's Law Enforcement Division is contacted at (415)876-9078.

(p) That the Biological Monitoring Plan is approved by the Service and in place before any construction related activities on or adjacent to the west-of-Bayshore site occur.

(q) That no smoking is allowed on or adjacent to the west-of-Bayshore parcel.

2. To implement Reasonable and Prudent Measure number two the FTA shall ensure the following:

(a) That all vehicle travel will be limited to existing roads, roads proposed in the Biological Assessment or within proposed construction areas. No other off-road travel will be allowed without prior review and approval by the Service.

(b) That vehicle speed limits of 10 mph are observed on and adjacent to the west-of-Bayshore site.

(c) That all entry gates to the west-of-Bayshore parcel not used for construction access are locked at all times and that gates used for construction access are locked during non-construction hours.

(d) That materials used to construct the mitigation ponds (p.5) are free of contaminants.

(e) That no refueling of vehicles will occur on or adjacent to the west-of-Bayshore parcel.

(f) That all excavated material will be removed and disposed of off-site.

(g) That all vehicles will carry a suitable fire extinguisher.

(h) That conversion of temporary access roads to all-weather roads will be by use of steel grating, wood grating, timber mats or concrete-grate block to reduce the amount of soil compaction and surface disturbance and enhance the recovery of wetlands and uplands. Grate, mat, or block is to be placed on the tire tracks only, not on the entire roadbed.

(i) Steel plates (used to access wetlands) will be temporarily removed to allow sunlight to reach the wetland vegetation during non-construction periods (e.g., nights and weekends).

(j) That if the temporary access road to the laydown area crosses Cupid's Row Canal, the FTA receives written authorization from the Service before the access road is constructed.

(k) That there is placement of 4 dry-culverts, 18 to 24 inches in diameter, under the CalTrain tracks in the vicinity of the mitigation ponds, and that the culverts are placed in such a manner as to allow free movement of San Francisco garter snakes under the tracks.

(l) That the on-site mitigation measures are performed, monitored, and maintained by BART or a Service approved designated agent.

(m) That an annual report on the Capture Feeding Program is provided to the Service for the life of the project. The first report will be due 12 months after construction begins with subsequent reports following every 12 months.

(n) That all bullfrog abatement activities including final program design are approved by the Service in advance and that bullfrog abatement activities are initiated before any construction related activities on or adjacent to the west-of-Bayshore parcel begin.

(o) That the Revegetation and Soil Erosion Control Plan is approved by the Service prior to completion of construction activities occurring on the west-of-Bayshore parcel.

3. To implement Reasonable and Prudent Measure number three the FTA shall ensure the following:

(a) That Service personnel will be given access to all construction, easement, and mitigation areas.

(b) That the Service will be allowed to release California red-legged frogs and San Francisco garter snakes within the habitat creation and/or preservation areas.

(c) That the San Francisco Garter Snake Capture Feeding Program is approved by the Service and in place before any construction related activities on or adjacent to the west-of-Bayshore site occur.

(d) That an aerial photograph with an overlay of the project impact areas and exact acreages of permanent and temporary impacts are provided to the Service before any construction related activities occur on or adjacent to the west-of-Bayshore parcel.

(e) That annual reports are provided to the Service for the first five years for each of the following programs: Alteration of culverts to seasonal wetlands at the south end of the west-of-Bayshore; management of the Cupid Row Canal tidal gates; and, bullfrog abatement. The first report will be due 12 months after construction begins with subsequent reports following every 12 months.

(f) That a report is provided to the Service for the Hydrologic study within 2 months of the completion of the study.

(g) That either Steele Ranch or an alternate, Service approved, parcel is acquired before the option to buy Steele Ranch expires, but no later than January 15, 1997.

(h) That all lands provided as mitigation for impacts to the San Francisco garter snake and California red-legged frog are maintained and protected in perpetuity and that any land manager designated to manage these lands, or hold them under protective easements, is approved by the Service.

(i) That mitigation ponds are filled with water from an Service-approved water supply as soon as they are built. The ponds must hold water that is a minimum of 3-1/2 feet in depth and a maximum of 5 feet in depth. The ponds will be dewatered between October

15 and November 15, will remain dewatered for a minimum of two weeks, and will be refilled between December 1 and December 15 every year.

(j) That a sound wall is built on the western side of the mitigation ponds located west of the CalTrain tracks to provide protection for the ponds. The location and design of the wall will be approved by the Service and will be in place before any construction related activities associated with the BART Extension on or adjacent to the west-of-Bayshore parcel occur.

Reporting Requirements

The FTA should require reporting of all translocated California red-legged frogs to the Service at the letterhead address, and the Service should be notified at 503-231-6131 and 916-979-2725 by the FTA immediately of any dead or sick individuals found in or adjacent to the project area, and cause of death or illness, if known, also should be conveyed to these offices. The FTA should immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Reporting Recommendations

The FTA should require reporting of all translocated California red-legged frogs to the Service at the letterhead address, and the Service should be notified at 503-231-6131 and 916-979-2986 by the FTA immediately of any dead or sick individuals found in or adjacent to the project area, and cause of death or illness, if known, also should be conveyed to these offices. The FTA should immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Sections 2(c) and 7(a)(1) of the Act direct federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species and the ecosystems upon which they depend. Conservation recommendations are Service suggestions regarding discretionary agency activities and are used to guide the agency in what is needed to minimize or avoid the adverse effects of a proposed action on listed species or critical habitat. Conservation recommendations can be used to help implement recovery plans, or to acquire important information (50 CFR §402.02).

1. The FTA should chose the locally preferred alternative (Alternative IV - Subway) which, as originally designed, would tunnel under the west-of-Bayshore parcel and avoid most or all impacts to the San Francisco garter snake and California red-legged frog. This locally preferred alternative was selected by BART, SamTrans, and the Metropolitan Transportation Commission based on engineering feasibility, transit ridership, integration with other transit systems, costs, environmental analysis, and public comment.
2. Any wetland creation associated with the 404 permiting process should be beneficial to the San Francisco garter snake or other listed species.

REINITIATION - CLOSING STATEMENT

This concludes the formal consultation and conference for the proposed action. You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the California red-legged frog is listed. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during conference, the Service may confirm the conference opinion as the biological opinion on the project and no further section 7 consultation may be necessary.

As required by 50 CFR §402.16, reinitiation of formal consultation is required if: (1).the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an adverse effect to the listed species or critical habitat that was not considered in this biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take ceases to have the protective coverage of section 7(o)(2) of the Act.

If you have any questions regarding our response, please contact Ms. Kelly Geer of my office at(916)979-2725.

Sincerely,

Dale A. Pierce

for Joel A. Medlin
Field Supervisor

Enclosure

cc: ARD, Klamath and California Ecoregions, Region 1, Portland, Oregon
CDFG, Region III, Yountville, Attn: Carl Wilcox,
FWS, Wetlands Branch, Attn: Jason Davis
Corps of Engineers, San Francisco District

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U.S. Army Corps of Engineers–Section 404

- USACOE Public Notice of 404 Permit Application
- USACOE Preliminary Agreement per NEPA/404 Integration Memorandum of Understanding
- U.S. EPA Preliminary Agreement per NEPA/404 Integration Memorandum of Understanding
- USFW&S Preliminary Agreement per NEPA/404 Integration Memorandum of Understanding
- Mitigation and Restoration Proposal for 404 permit application

SAN FRANCISCO DISTRICT

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PUBLIC NOTICE

US Army Corps
of Engineers

NUMBER: 19669S91 DATE: 1 March 1996

Regulatory Branch
211 Main Street
San Francisco, Ca. 94105-1905

RESPONSE REQUIRED BY: 30 March 1996

PERMIT MANAGER: Bob Smith (415) 744-3324 x237 / rsmith@smtp.spd.usace.army.mil

1. The Bay Area Rapid Transit District (BART), 800 Madison Street-Lake Merritt Station, P.O. Box 12688, Oakland, California 94604-2688, [contact: Ms. Karita Zimmerman (510) 287-4866] has applied for a Department of the Army permit to excavate and place fill in Corps jurisdiction to extend the San Francisco Bay Area Rapid Transit System from the Town of Colma to the northern portion of the City of Burlingame, in San Mateo County, California. This application is being processed pursuant to the provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)..

2. The applicant has informed the Corps the BART-San Francisco International Airport (BART/SFO) Extension project has been a part of the proposed Bay Area transportation network for over twenty years. The project is being advanced primarily to carry out the public mandate for the project, responding to a regional need to alleviate highway congestion, and to improve air quality. The need for transportation improvements in Northern San Mateo County exists because of the projected growth and transportation deficiencies that are both regional and local in character. The proposed BART/SFO project has been identified by the Bay Area Air Quality Management District as one of the key transportation related measures aimed at achieving and maintaining improved air quality in the region. The proposed project has been the subject of a long and extensive series of planning studies, environmental analyses and documentation and public review. The proposed project is the result of these activities and is known as the Alternative VI Aerial Design Option.

As shown on the attached drawings, BART plans to construct the tracks, stations, parking lots and related facilities necessary to extend the BART system from its current terminus at the Colma Station, which would open in February, 1996, to the vicinity of the SFO. The proposed project involves the construction of four BART stations: the South San Francisco Station (also known as the Hickey Station), the San Bruno Station, the Millbrae Station and the SFO Station. In addition, approximately eight miles of parallel BART tracks either at grade, below grade (subway) or in an aerial configuration would be built to connect these stations.

The project corridor is located in northern San Mateo County. The corridor which measures nearly eight miles in length, has a northern terminus that lies in the unincorporated Colma area, a small urban neighborhood located between Daly City and the Town of Colma. The corridor extends south through the Town of Colma and the cities of South San Francisco and San Bruno, a small portion of unincorporated San Mateo County owned by the San Francisco International Airport, the City of Millbrae and into about 1,500 feet of the northern portion of the City of Burlingame.

The impact of the proposed BART/SFO Extension project on areas of Corps jurisdiction is limited to six distinct sites. These sites are indicated along the proposed project alignment on Sheet 2 of the attached drawings and are identified as: (A) Colma Creek; (B) Twelve Mile Creek; (C) Wetland and Drainage Ditch at South Spruce Ave.; (D) Drainage swale North of the San Bruno CalTrain Station; (E) Cupid Row Canal, and; (F) Main Line and Aerial Wye to the SFO Station in the west-of-Bayshore parcel area. The nature of the impacts at each of these sites from the proposed project are described below.

A., **Colma Creek** (Sheets 3 - 21) Colma Creek runs within a concrete-lined channel which has about 10-year event flood capacity in the range of the proposed project. Several modifications are proposed for the project reach of Colma Creek (approximately 5,400 linear feet) to provide 100-year flood protection while accommodating the proposed BART alignment. These proposed modifications are described as follows.

Diversion Structure (Sheets 11 and 14)- At the upstream end of the project, approximately 20 cubic yards of material would be placed in the existing Colma Creek channel below the line of ordinary high water (OHW) to construct a temporary diversion structure. The fill material would be selected by the contractor, but would be such that it would not create an erosion source. Possible fill material would be clean gravel or concrete in sand bags. The stream flow would be diverted around the construction area by pumping into a diversion pipe with a discharge point back into the creek downstream of the project. The construction is to be completed in one six month dry season (April 15 -October 15). Upon completion of the project, the diversion structure, pump and pipe would be completely removed and the area restored to pre-project conditions.

Realignment and/or Widening (Sheets 6 - 10) - At several locations, as shown on the drawings, the existing Colma Creek channel is proposed to be realigned and/or widened to accommodate the project and to provide 100-year flood capacity (San Mateo County Flood Control District design criteria for Colma Creek). At those locations, portions of the existing channel would be filled and replaced with a new enlarged concrete lined channel to be constructed as shown. Where the existing creek is to be realigned and/or widened the area of fill to be placed in the existing channel would be balanced by the area of channel created to realign (widen) the new enlarged channel. These modifications to Colma Creek would not result in any net loss of jurisdictional area.

Box Culverts (Sheets 8 - 10) - As shown on the drawings, the existing Colma Creek channel in the vicinity of the planned South San Francisco BART Station is proposed to be filled and the flow routed to newly constructed triple and quadruple concrete box culverts. The placement of this reach of Colma Creek into an underground concrete box structure would result in the loss of these channel areas as open water. This would remove approximately 20,000 square feet (0.46 acres) of jurisdictional area below the line of Ordinary High Water (OHW) in this reach of the channel. The loss of this habitat area is included in the proposed wetland mitigation site at a replacement ratio of 1:1.

Drainage Swale (Sheet 12) - As shown on the drawings, at the site of the proposed South San Francisco Station parking lot, a small wetland swale is proposed to be covered over and replaced by a underground box-culvert. The area of the wetland swale to be impacted is approximately 1,300 sq. ft. (.03 acre). The loss of this habitat is to be replaced at a 1:1 ratio at the proposed wetland mitigation site.

B. **Twelve Mile Creek** (Sheets 22 - 26)

Twelve Mile Creek is currently a concrete-lined channel through the project reach south of Chestnut Ave. in South San Francisco. Upstream of the proposed BART subway it is confined to a small concrete lined channel. As the creek enters the proposed construction area, it passes through twin concrete box culverts under the former Southern Pacific railroad alignment. Downstream of the proposed BART project the creek continues in a concrete-lined channel. The proposed modifications to the creek are as follows.

Diversion Structure - As shown on the drawings, approximately 16 cubic yards of material would be placed in the existing Twelve Mile Creek channel below the line of OHW to construct a temporary diversion structure. The fill material would be selected by the contractor, but would be such that it would not create an erosion source. Possible fill material would be clean gravel or concrete in sand bags. The stream flow would be diverted around the construction area by pumping into a diversion pipe with a discharge point back into the creek downstream of the project. The construction is to be completed in one six month dry season (April 15 - October 15). Upon completion of the project, the diversion structure, pump and pipe would be completely removed and the area restored to pre-project conditions.

Box Culvert - A 200-foot reach of Twelve Mile Creek would be temporarily disturbed to allow for the excavation and placement of the BART subway box and tracks. Once the BART subway is in place, the segment of existing concrete box culvert removed would be replaced in kind and the existing concrete creek channel restored. These modifications to Twelve Mile Creek would not result in any permanent impacts or net loss of jurisdictional area and therefore are not included in the proposed mitigation measure.

C. **Wetland and Drainage Ditch at South Spruce Avenue** (Sheets 27 - 31)

The area consists of a drainage channel, between two culverts, paralleling Spruce Ave. and a seasonal wetland which has developed immediately north of, and adjacent to the proposed BART alignment. The seasonal wetland is located in a depression, between two former railroad alignments. The proposed BART subway would be constructed though this area utilizing cut and cover methods. Both the drainage channel and the seasonal wetland would be temporarily disturbed by this activity. Approximately 1350 square feet (0.05 acre) of the open ditch and 11,000 square feet (0.25 acre) of the adjacent seasonal wetland would be temporarily disturbed and both these areas would be restored following completion of the subway. Flows in the drainage ditch would be diverted through a pipe during the six month construction period in the dry season (April 15 - October 15).

Approximately two cubic yards of fill material would be placed to create a temporary earthen dam immediately upstream of a headwall and culvert upstream or west of the proposed BART alignment. A historically significant headwall and culvert adjacent to South Spruce Avenue would be removed during construction of the BART subway alignment in the area. In accordance with state and federal guidelines on historic properties, the project proponents expect upon completion of construction the historically significant headwall and culvert would be replaced and restored in its original location. The temporary earthen dam fill would be removed and the area restored to its original condition.

These temporary disturbances to the drainage ditch and seasonal wetland in the South Spruce Avenue area would not result in any permanent impacts or net loss of jurisdictional area and therefore are not included in the proposed mitigation measure.

D. **Drainage Swale North of the San Bruno CalTrain Station** (Sheets 32 - 36)

This area consists of a small ephemeral drainage swale between the CalTrain track alignment to the east and Huntington Avenue to the west and located just north of the existing San Bruno CalTrain Station platform. The swale conveys storm water from Huntington Avenue to a 24-inch culvert crossing under the CalTrain tracks. Construction of the cut and cover section of the project would intersect this wetland. Prior to construction, a temporary submersible pump would be installed in the catch basin adjacent to Huntington Avenue. During construction, water would be pumped across the BART alignment to the east side and discharged into the existing 24-inch diameter culvert located at the end of the drainage swale.

Approximately 250 square feet (0.01 acre) of the swale would be permanently displaced by the construction of a BART Traction Power Gap Breaker Building. Approximately 6.5 cu. yds. of concrete fill would be placed into the portion of the drainage ditch below OHW. The remainder of the swale (approximately 375 sq. ft. or 0.01 acre) would be temporarily disturbed by the cut and cover construction of the BART subway alignment in this area. The area temporarily disturbed would be restored in-kind and in-place following construction. The permanent loss of 0.01 acre of OHW area (drainage swale) in this area is included in the proposed wetland mitigation site at a replacement ration of 1:1.

E. **Cupid Row Canal** (Sheets 37 - 43)

The impacted areas at the Cupid Row Canal site consists of that portion of the Canal located from a point about 30 feet west of the existing northern entry road bridge to the SFO, west-of-Bayshore parcel, and extending west to Huntington Avenue east of the CalTrain tracks, and impacts associated with the proposed construction laydown area and construction equipment access route. Cupid Row Canal flows in a northeasterly direction though a box culvert that crosses under Huntington Ave. It then flows for approximately 65 feet in a natural shaped earthen channel before entering into an approximately 50 foot long railroad culvert. After the railroad culvert, it continues for approximately 70-feet in a natural earthen creekbed to a 60-foot long culvert under the access road to the west-of-Bayshore parcel. From this point the Canal continues northeast in an open earthen channel to Highway 101. The proposed modifications to the canal are as follows.

Diversion Structure - As shown on sheet 40, approximately 10 cubic yards of material would be placed in the existing Cupid Row Canal below the line of OHW to construct a temporary diversion structure. The fill material would be selected by the contractor, but would be such that it would not create an erosion source. Possible fill material would be clean gravel or concrete in sand bags. The stream flow would be diverted around the construction area by pumping into a diversion pipe with a discharge point back into the creek downstream of the project. The construction is to be completed in one six month dry season (April 15 - October 15). Upon completion of the project, the diversion structure, pump and pipe would be completely removed and the area restored to pre-project conditions.

Canal Realignment - The BART cut and cover alignment cuts through the open earthen creekbed segment between the railroad and access road culverts. As shown on sheet 40, in order to maintain the creek invert elevation and allow adequate separation between the top of the BART subway box and the channel bottom, it is necessary to relocate the channel crossing to the north. After exiting the culvert under Huntington Ave. a new channel would be created directing the flow approximately 75-feet north into two new 4' x 10' concrete box culverts constructed under the CalTrain tracks. It would then cross above the BART alignment through a new channel constructed following completion of the cut and cover construction of the BART box. The flow would then enter two new 4' x 10' concrete box culverts under the entrance road and would be directed back into the original Cupid Row Canal east of the access road.

The abandoned reach of the existing canal, including the railroad and access road culverts would be filled, sloped to drain and restored to match surrounding conditions. The amount of filled jurisdictional areas within the existing channel alignments (approximately 2,660 sq. ft. , 0.06 acres) would be nearly equivalent to the amount of new open channel habitat that would be created (approximately 3,100 sq. ft., 0.07 acres) and the impacts would therefore be mitigated at the site when the project is completed.

Tributary Channel - As shown on sheets 40 and 41, an existing tributary channel to the north would be temporarily diverted into a pump and pipe system by placing sand bags at the diversion point and pumped downtream to discharge into Cupid Row Canal. South of the new alignment 55 linear feet of the existing channel would be filled and graded to drain and match surrounding conditions. This approximately 385 square feet (0.01 acre) of jurisdictional area would be replaced at the designated mitigation site at a 3:1 ratio. The remaining 330 feet of the tributary channel would be restored in its present condition and at its current location following completion of the project.

Construction Laydown Area and Access Route - As shown in sheet 43A, BART proposes to establish a temporary construction laydown area next to Cupid Row Canal on the west-of-Bayshore parcel. There are two isolated seasonal wetlands within the area BART proposes to use as for a construction laydown area. These two seasonal wetlands (approximately 0.04 acre) would be disturbed during project construction and use of this site as a laydown area but would be restored to pre-project construction conditions at the same locations they now exist at. The proposed construction access route would exit and/or enter the northern end of the proposed construction laydown area, cross Cupid Row Canal over an existing bridge, continue east along an existing dirt road to a point where the road reenters the west-of-Bayshore parcel near the 4-H Club facilities. The proposed route would then proceed to the north to the PG&E Substation and then turn east again cross over Cupid Row Canal and connect with Highway 101. The dirt road along the entire access route would need to be widened from approximately 10 feet to approximately 25 feet and improved to an all-weather roadway. This widening of the existing dirt road would require the placement of fill material in an adjacent seasonal wetland. The roadway would be constructed on top of a matting material to reduce the amount of soil compaction and enhance the recovery of the wetland when the fill for the roadway and matting are removed after completion of project construction. This action would temporarily disturb approximately 0.09 acre of seasonal wetland that would be restored to pre-project conditions after completion of project construction. The crossing of Cupid Row Canal at this point would be via a preconstructed trestle that would completely span the channel and not involve the placement of any fill below the OHW level of the channel. This is the only proposed construction laydown area that would involve the disturbance of wetlands or other waters for the proposed project.

F. Main Line and Aerial Wye

As shown on sheets 44 - 74, the Main Line and Aerial Wye site within and in the vicinity of the west-of-Bayshore parcel includes project related activities involving both northern and southern portions of San Felipe Canal and northern and southern portions of South Lomita Canal. In addition, the aerial wye alignment would cross over a seasonal wetland on the east side of the west-of-Bayshore parcel. The drawings and description of the expected impacts at this location are included in the San Felipe Canal (Southern Portion) information. These project related activities and associated impacts are discussed in more detail below.

Southern Portion of San Felipe Canal (Sheets 58 - 66)

PG&E New Transmission Towers -BART has worked with PG&E to determine the best way of relocating the existing San Mateo-Martin 115kV tower lines in the area that the proposed aerial wye stubs would cross the west-of-Bayshore parcel (see Sheet 61). In order to allow the BART aerial structures to pass beneath the transmission lines, PG&E would raise the lines by erecting five or six new tubular steel towers adjacent to the proposed BART structures. Installation of the new tubular towers would require the placement of a temporary construction access berm approximately 50-75 feet in width within the wetland area between the two aerial wye stubs. The earthen berm would be constructed on top of a matting material to reduce the amount of soil compaction and enhance the recovery of the wetland when the berm and matting are removed after the new towers are erected and the area restored. The only permanent loss of wetland habitat would occur at the point that the tubular tower meets the ground. Each tower would be approximately 10 feet in diameter and thus displace approximately 79 sq. ft. or a total of approximately 314 sq. ft. (0.01 acre) for four towers within the seasonal wetland. The permanent loss of this wetland area would be mitigated at the proposed mitigation site at a 3:1 replacement ratio.

Access to the site would be via the existing paved and dirt access roads on the west-of-Bayshore parcel south of the construction site. Temporary relocation of the transmission lines to a wood pole or "shoo-fly" line would be required. The shoo-fly line would be located on upland habitats along the dirt access road immediately west of the existing transmission line alignment and would remain in place until the work on the affected lines is completed.

Aerial Wye Trackway Footings in Seasonal Wetland (Sheet 61)- As with the PG&E new tubular towers, BART would need to place two aerial wye trackway footings in the seasonal wetland on the east side of the west-of-Bayshore parcel. Although the excavation for the concrete footings would disturb a larger area than the area each column would displace these impacts would be temporary and the wetlands would be restored in place after the construction work is completed. The only permanent loss of wetland habitat would occur at the point that the columns meet the ground. Each footing would have two columns, each with a diameter of 6.33 feet. The four columns would permanently displace approximately 126 square feet (0.003 acre). The loss of this wetland area would be mitigated at the proposed mitigation site at a 3:1 ratio.

San Felipe Canal - As indicated in Sheet 65 and Sheet 72, at the point the proposed access road to the car wash would cross over from the west side to the east side of San Felipe Canal to where the second footing and three columns of the northern aerial wye trackway San Felipe Canal would be relocated to the east of these features. The portion of San Felipe Canal that currently exists in this reach would be filled but the realigned channel would compensate for this loss on site and thus no additional mitigation is proposed for this impact.

Seasonal Wetland on San Felipe Canal (Sheet 64)- An existing seasonal wetland in the vicinity of San Felipe Canal would be replaced in part by the location of BART mainline tracks and proposed car wash. BART has proposed to place a third storage track along the mainline alignment between the aerial wye segments for a proposed car wash. At the present time there is no car wash facility on the west side of the Bay for the BART system, and one is needed. BART has considered other locations for the proposed car wash along the proposed project alignment, however, all other possible sites were operationally far less optimal and far more costly. This action would permanently displace approximately 7600 sq. ft. (0.17 acre) of seasonal wetlands at this location. The loss of this wetland area would be mitigated at the proposed mitigation site at a 3:1 ratio.

Small Drainage Ditch (Sheet 64)- The impacted wetlands at the southern portion of San Felipe Canal include a small storm water drainage ditch which currently flows east from a 24" reinforced concrete pipe near the intersection of San Antonio Avenue and Santa Clara Avenue. At this point the ditch is an open natural drainage that flows east to San Felipe Canal. The eastern most reach of this ditch would be intersected by the BART/SFO Extension Project. The ditch would require installation of a 24" culvert for approximately 70' along the existing flow path to allow flow to continue under the BART tracks and into the San Felipe Canal. Placement of the ditch in the culvert would permanently remove approximately 400 sq. ft. (0.01 acre) of existing open channel habitat. The loss of this jurisdictional waters area would be mitigated at the proposed mitigation site at a 3:1 ratio.

Northern Portion of San Felipe Canal (Sheets 67 - 74)

San Felipe Canal - San Felipe Canal flows from the west to the east through two 42" X 66" culverts under the railroad tracks into an open channel into the west-of-Bayshore parcel. As shown on sheet 72, the existing culverts would be extended under the BART track alignment into the west-of-Bayshore parcel. This action would place approximately 0.05 acre of open channel jurisdictional waters in a culvert. This loss of jurisdictional area would be mitigated at the proposed mitigation site at a 3:1 ratio. Upon exiting the new culverts, the flow would be rerouted into the existing San Felipe Canal which would be left in place and would run alongside the new access road retaining wall.

Seasonal Wetland - Immediately downstream of the point the San Felipe Canal enters the west-of-Bayshore parcel there is an existing seasonal wetland area (see sheet 72). The proposed BART track alignment and car wash access road would permanently displace approximately 0.36 acre of wetland habitat. The loss of this wetland area would be mitigated at the proposed mitigation site at a 3:1 ratio.

Drainage Ditches West of the CalTrain Tracks - North of the two site noted above, an existing series of drainage ditches on the west side of the CalTrain tracks flows under the CalTrain tracks in two 36" culverts. West of the tracks, this ditch is an exposed channel for approximately 40 feet and then enters a buried 24" culvert on the west-of-Bayshore parcel. As shown on sheet 73, the culverts under the railroad tracks would be extended east under the proposed BART tracks and west to a point just beyond the proposed sound wall. These actions would place approximately 0.02 acre of jurisdictional "waters" in a culvert. This permanent impact would be mitigated at the proposed mitigation site at a 3:1 ratio.

The placement of the soundwall on the west side of the CalTrain tracks would displace one of the drainage ditches in this location. This ditch would be relocated to the immediate west of this ditches current alignment. The existing ditch would be filled and the relocated ditch constructed to match the pre-project condition of the existing ditch. The filling of the existing ditch would be mitigated at the site with the new realignment.

Southern Portion of South Lomita Canal (Sheets 44 - 49)

Within the area of the southern portion of the South Lomita Canal there is a concrete lined channel west of the CalTrain tracks which conveys collected storm water east through two 60-inch diameter culverts crossing under the CalTrain tracks into an unlined tributary channel that flows into South Lomita Canal. In addition, there is an unlined drainage ditch on the east side of the CalTrain tracks that conveys storm water from Madrone Street to the unlined tributary channel noted above. These are the jurisdictional areas that would be impacted by the proposed BART-SFO Extension project in this area.

As indicated on the attached drawings, construction of the southern portal of the mainline alignment for the BART/SFO Extension project would intersect the east side of the existing culverts and both the unlined channel and Madrone Street drainage ditch. A portion of the existing concrete channel, the headwall and the two 60-inch diameter culverts under the Cal Train tracks would be abandoned and filled in place with approximately 147 cubic yards of clean fill material. The concrete lined channel would be rerouted to the north and would tie into the inlet for a new 5-ft by 8-ft reinforced box culvert under the CalTrain tracks. The new concrete channel would be the same width and length as the existing concrete channel and thus would replace the existing habitats on site. This new concrete channel would however displace approximately 0.02 acre of seasonal wetland habitat that occurs in the alignment of the new concrete channel. This displacement of seasonal wetland with a concrete channel would be mitigated at the proposed mitigation site at a 1:1 ratio.

The new box culvert under the CalTrain and BART tracks would discharge directly into South Lomita Canal. Approximately 80 linear feet of the unlined tributary channel from the existing culverts east to South Lomita Canal would be filled for the BART portal structure. This action would remove approximately 0.02 acre of jurisdictional "waters" that would be mitigated for at the mitigation site at a 3:1 ratio. The remaining portion of the unlined channel would be maintained in its original state to receive drainage from the Madrone Street ditch which would be rerouted east of the BART portal. The new rerouted earthen channel would be approximately the same width and length as the existing ditch and thus would mitigate the temporary loss at this ditch on site.

Northern Portion of South Lomita Canal (Sheets 50 - 57)

As shown on sheet 55, one aerial wye support column would be placed in the far southern end of San Felipe Canal where it empties into South Lomita Canal. Sandbags would be placed at the confluence of the two canals to prevent water from backing up into the work area. The channel would be excavated for a support footing and two columns for the southern aerial trackway. This action would require the excavation of approximately 134 cubic yards of material below the OHW area of the channel. The excavated volume would be replaced with concrete for the footing and east bank of the channel and earth in the channel bottom. Since the channel is to be widened in this area the impact of the excavation and fill would be balanced by the added jurisdictional area in the channel.

If flow conditions require, a temporary earthen dam would be placed on San Felipe Canal north of the aerial wye alignment to route the flow into a temporary bypass pipe up around the construction site and into South Lomita Canal. The dam, if needed, would require the placement of 10 cubic yards of fill below the OHW and would be completely removed upon completion of construction and the area restored to pre-project conditions.

Sensitive Species

The proposed project would result in the loss of habitat for the San Francisco Garter Snake (*Thamnophis sirtalis tetrataenia*), listed as Endangered under the Federal Endangered Species Act (FESA), the California red-legged frog (*Rana aurora draytonii*) which has been proposed for listing under the FESA, and the San Francisco forktail damselfly (*Ischnura gemina)* which is a candidate for listing under the FESA. The Federal Transit Administration Region IX, of the U.S. Department of Transportation is currently engaged in a formal consultation under Section 7 of the FESA with the U.S. Fish and Wildlife Service on the San Francisco Garter Snake, and conferences on the California red-legged frog and the San Francisco forktail damselfly.

Mitigation Sites

BART proposes to mitigate for those unavoidable permanent loss of jurisdictional areas by creating wetland habitats out of upland habitats at one location next to Colma Creek in the City of South San Francisco as defined below and presented on Sheet 1 of the drawings.

The mitigation site for the proposed project's impacts to jurisdictional areas is located on the north side of Colma Creek immediately downstream or south of the proposed South San Francisco BART Station (see sheet 1). The mitigation site consists of land owned by the City and County of San Francisco Water Department. The parcel (approximately 4.2 acres) is within the old Muni right-of-way and above the proposed BART underground alignment. A linear parcel, it runs from the south end of the South San Francisco Station for approximately 2200 linear feet south to the point where Colma Creek crosses the proposed BART right-of-way.

This parcel of land does not contain any areas which would meet the definition of waters of the U.S., as defined by the Clean Water Act. The abandoned Muni railroad tracks occur within the parcel and the surrounding habitats consist of highly disturbed ruderal (weedy) vegetation dominated by nonnative grasses and forbs, with scattered thickets of coyote brush *(Baccharis pilularis)* and willows *(Salix sp.)*.

The proposed project would permanently displace approximately 1.16 acres of wetland habitats and U.S. Waters. The proposed mitigation plan would create more than 2.5 acres of wetland and creek habitat.

A year-round low velocity creek and associated wetland habitats would be developed on the mitigation site. The water source for this mitigation site would originate from a diversion point on Colma Creek upstream of the proposed South San Francisco BART Station. In addition to the diversion structure in Colma Creek, the proposed mitigation plan would include an inlet structure, a series of drop or grade control structures (weirs) designed to create riffles and flat bottom pools, and an outlet structure. The banks of the low velocity creek would be planted with plant species typical of emergent wetlands, transitional uplands and riparian habitats.

The proposed project mitigation plan would be described in detail in the BART-SFO Extension Project Mitigation and Monitoring Plan to be submitted to the Corps in early March 1996.

3. The applicant states that he has notified the Regional Water Quality Control Board, San Francisco Bay Region, to determine the need for State water quality certification. If the State Water Resources Control Board determines that this project is consistent with the California Water Quality Control Plan, Requirements adopted by the Regional Board and Sections 301, 302, 303, 306 and 307 of the Clean Water Act, the State will issue a Certificate of Conformance with Water Quality Standards to the project proponent. Those parties concerned with any water quality problems that may be associated with this project should write to the Executive Officer, California Regional Water Quality Control Board, San Francisco Bay Region, 2101 Webster Street, Suite 500, Oakland, California 94612, by the close of the comment period of this public notice.

4. The Corps of Engineers has been a cooperating agency in the preparation of a joint Environmental Impact Report/Environmental Impact Statement for the proposed project. A series of joint state/federal environmental documents have been prepared and circulated on this project. The most recent is a Focused Recirculated Draft Environmental Impact Report/ Supplemental #2 Draft Environmental Impact Statement (FRDEIR/S#2DEIS) which was released for public review in September, 1995 and the public hearing was held on November 16, 1995. The State Lead Agencies are BART and the San Mateo County Transit District, the Federal Lead Agency is the Federal Transit Administration, Region IX, 201 Mission Street, Suite 2210, San Francisco, CA 94105. Copies of the FRDEIR/S#2DEIS) are available from those agencies and the document is available for review in the San Francisco District Office of the Corps of Engineers, Room 802, at 211 Main Street, San Francisco. This Public Notice by reference incorporates the FRDEIR/S#2DEIS and preceding documents.

5. Evaluation of this activity's impact on the public interest will also include application of the guidelines promulgated by the Administrator of the Environmental Protection Agency under Section 404(b) of the Clean Water Act, 33 U.S.C. Section 1344(b). The project has been conducted in accordance with the Memorandum of

Understanding (MOU) for the NEPA and Section 404 Integration Process for Surface Transportation Projects in Arizona, California and Nevada. The MOU provides guidance in the consideration of Section 404(b)(1) through the NEPA process for transportation projects. In accordance with the MOU-NEPA-404 Permit Concurrent Process the Draft Alternative Analysis is contained in the both draft environmental documents noted in Section 4 above.

6. The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest. Evaluation of the probable impacts which the proposed activity may have on the public interest requires a careful weighing of all those factors which become relevant in each particular case. The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. The decision whether to authorize a proposal, and if so the conditions under which it will be allowed to occur, are therefore determined by the outcome of the general balancing process. That decision will reflect the national concern for both protection and utilization of important resources. All factors which may be relevant to the proposal must be considered including the cumulative effects thereof. Among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people.

7. The Corps of Engineers is soliciting comments from the public, Federal, State and local agencies and officials, Indian Tribes, and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

8. Interested parties may submit in writing any comments concerning this activity. Comments should include the applicant's name, the number, and the date of this notice and should be forwarded so as to reach this office within the comment period specified on page one of this notice. Comments should be sent to: Lieutenant Colonel Michael J. Walsh, District Engineer, Attention: Regulatory Branch. It is Corps policy to forward any such comments which include objections to the applicant for resolution or rebuttal. Any person may also request, in writing, within the comment period of this notice that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing. Additional details may be obtained by contacting the applicant whose address is indicated in the first paragraph of this notice, or by contacting Bob Smith of our office at telephone 415-744-3324 Ext. 237 or E-mail rsmith@smtp.spd.usace.army.mil. Details on any changes of a minor nature which are made in the final permit action will be provided on request.

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PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING

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BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
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VICINITY MAP 50
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PLAN AND PROFILE (SK-61 THRU SK-63) 52
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PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING

LOCATION MAP INDEX

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
PAGE: 2 OF 3 FEBRUARY 1996

SHEET NUMBER

SOUTHERN PORTION OF SAN FELIPE CANAL

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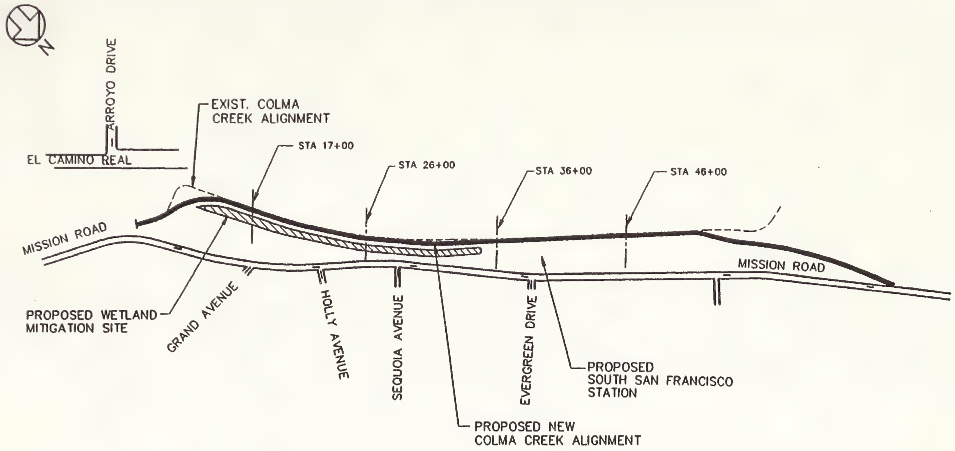
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

LOCATION MAP INDEX

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
PAGE: 3 OF 3 FEBRUARY 1996



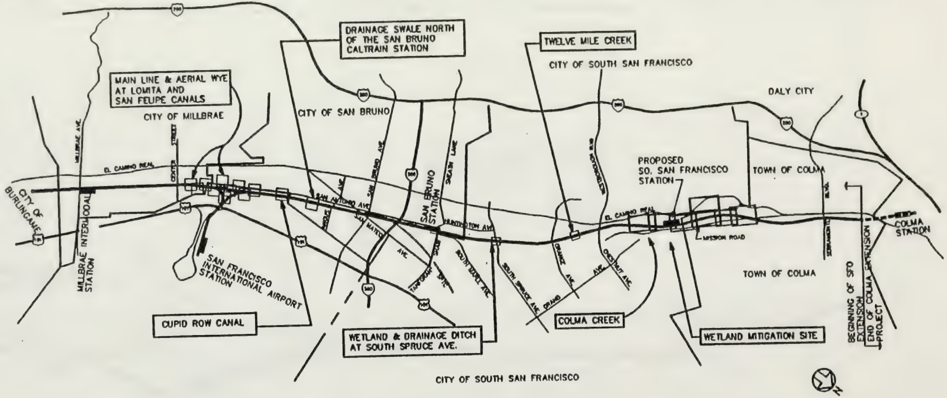
PURPOSE: PROVIDE RAPID TRANSIT SERVICE
TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

MITIGATION LOCATION MAP

SCALE: NTS

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED LOCATION OF WETLAND MITIGATION SITE
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 1 OF 74 FEBRUARY 1996


DRAINAGE SWALE NORTH OF THE SAN BRUNO CALTRAIN STATION
TWELVE MILE CREEK
CITY OF SOUTH SAN FRANCISCO
DALY CITY
MAIN LINE & AERIAL WYE AT LOMITA AND SAN FELIPE CANALS
CITY OF MILLBRAE
CITY OF SAN BRUNO
MILLBRAE AVE.
EL CAMINO REAL
CENTER STREET
SAN ANTONIO AVE
SAN BRUNO AVE
SAN BRUNO STATION
SNEATH LANE
HUNTINGTON AVE
PROPOSED SO. SAN FRANCISCO STATION
TOWN OF COLMA
MISSION ROAD
COLMA STATION
CITY OF BURLINGAME
MILLBRAE INTERMODAL STATION
SAN FRANCISCO INTERNATIONAL AIRPORT STATION
SAN MATEO AVE.
SOUTH MAPLE AVE.
SOUTH SPRUCE AVE.
GRAND
ORANGE AVE.
CHESTNUT AVE.
TOWN OF COLMA
CUPID ROW CANAL
WETLAND & DRAINAGE DITCH AT SOUTH SPRUCE AVE.
COLMA CREEK
WETLAND MITIGATION SITE
BEGINNING OF SFO EXTENSION
END OF COLMA EXTENSION PROJECT
CITY OF SOUTH SAN FRANCISCO
N

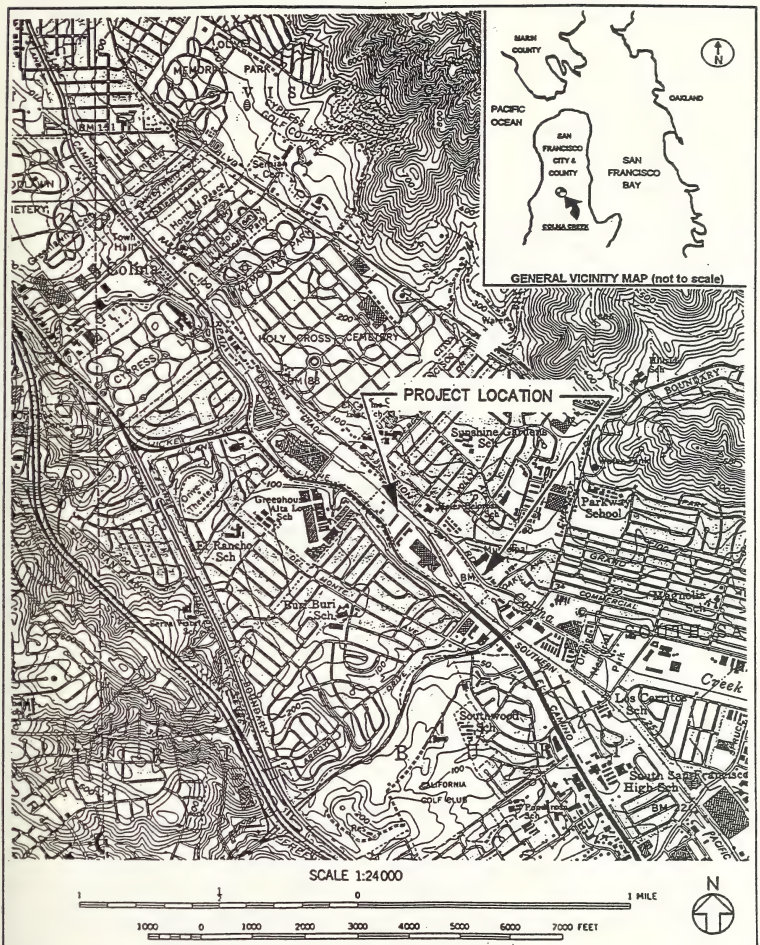
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING

WETLAND IMPACT SITES LOCATION MAP

SCALE: NTS

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 2 OF 74 FEBRUARY 1996

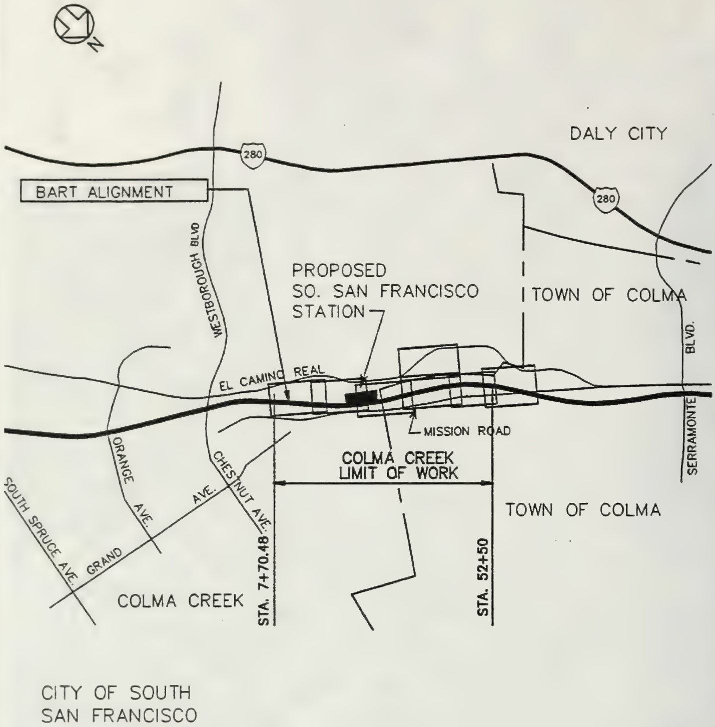


PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

COLMA CREEK
VICINITY MAP

SCALE: 1"=2000'
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 3 OF 74 FEBRUARY 1996



PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL

DATUM: NGVD 1929

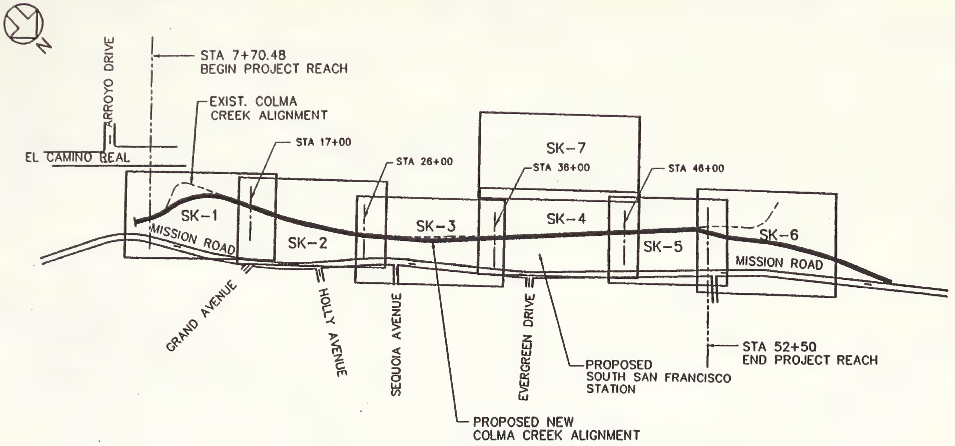
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

LOCATION PLAN

SCALE: NTS

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 4 OF 74 FEBRUARY 1996



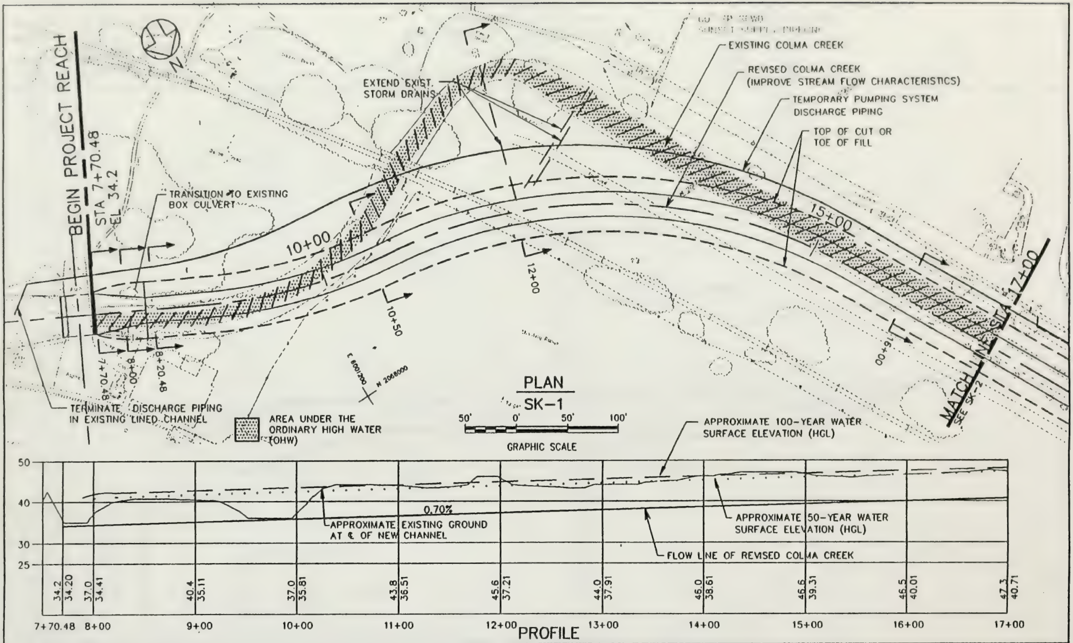
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

KEY PLAN OF SKETCHES

SCALE: NTS

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 5 OF 74 FEBRUARY 1996


BEGIN PROJECT REACH
STA 7+70.48
EL 34.2
TRANSITION TO EXISTING BOX CULVERT
EXTEND EXIST. STORM DRAINS
EXISTING COLMA CREEK
REVISED COLMA CREEK (IMPROVE STREAM FLOW CHARACTERISTICS)
TEMPORARY PUMPING SYSTEM DISCHARGE PIPING
TOP OF CUT OR TOE OF FILL
10+00
15+00
12+00
10+50
16+00
7+70.48
8+00
8+20.48
E 6001200
N 2068000
MATCH LINE STA 17+00
SEE SK-2
TERMINATE DISCHARGE PIPING IN EXISTING LINED CHANNEL
AREA UNDER THE ORDINARY HIGH WATER (OHW)
PLAN
SK-1
50'
0'
50'
100'
GRAPHIC SCALE
APPROXIMATE 100-YEAR WATER SURFACE ELEVATION (HGL)
50
40
30
25
0.70%
APPROXIMATE EXISTING GROUND AT ℄ OF NEW CHANNEL
APPROXIMATE 50-YEAR WATER SURFACE ELEVATION (HGL)
FLOW LINE OF REVISED COLMA CREEK
34.2
34.20
37.0
34.41
40.4
35.11
37.0
35.81
43.8
36.51
45.6
37.21
44.0
37.91
46.0
38.61
46.6
39.31
46.5
40.01
47.3
40.71
7+70.48
8+00
9+00
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
PROFILE

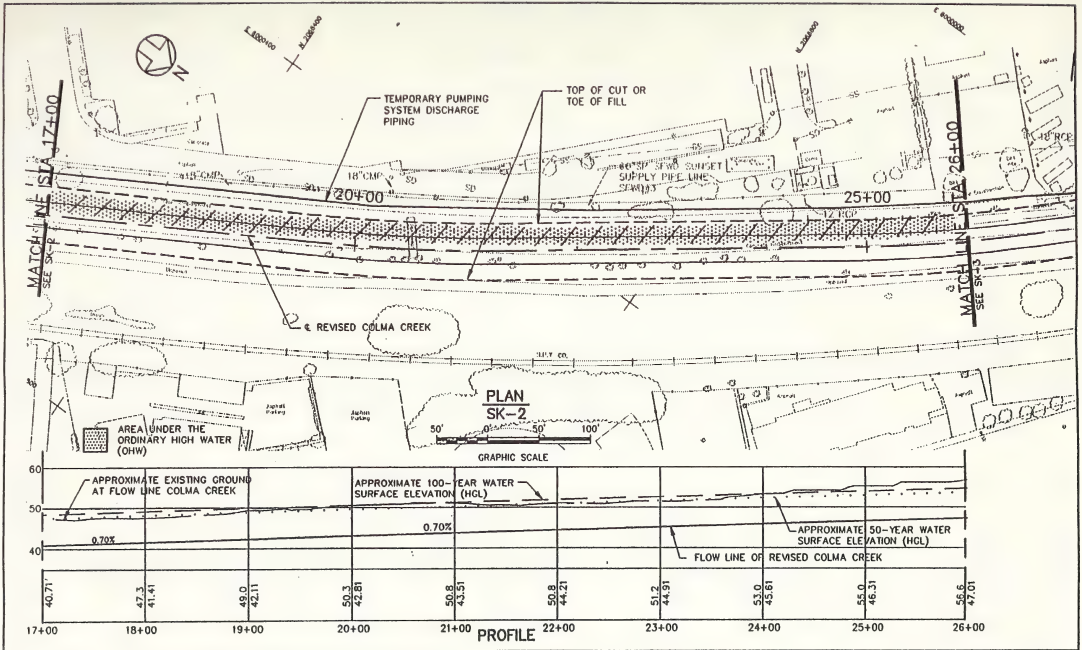
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

PLAN AND PROFILE

SCALE: 1"=100'H; 1"=25'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 6 OF 74 FEBRUARY 1996



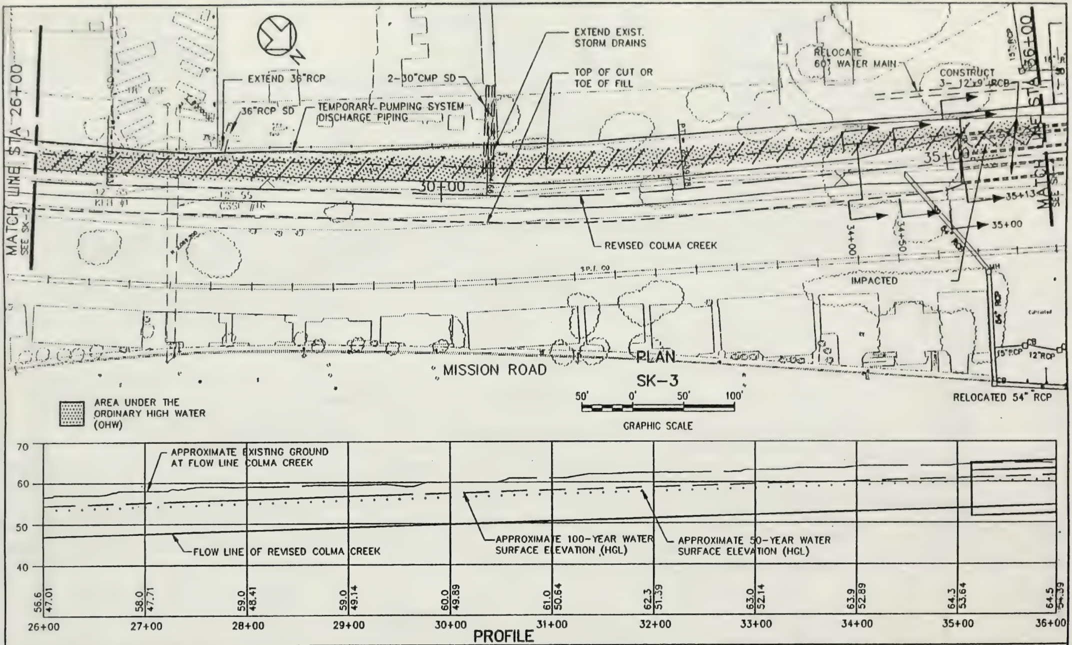
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

PLAN AND PROFILE

SCALE: 1"=100'H; 1"=25'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 7 OF 74 FEBRUARY 1996



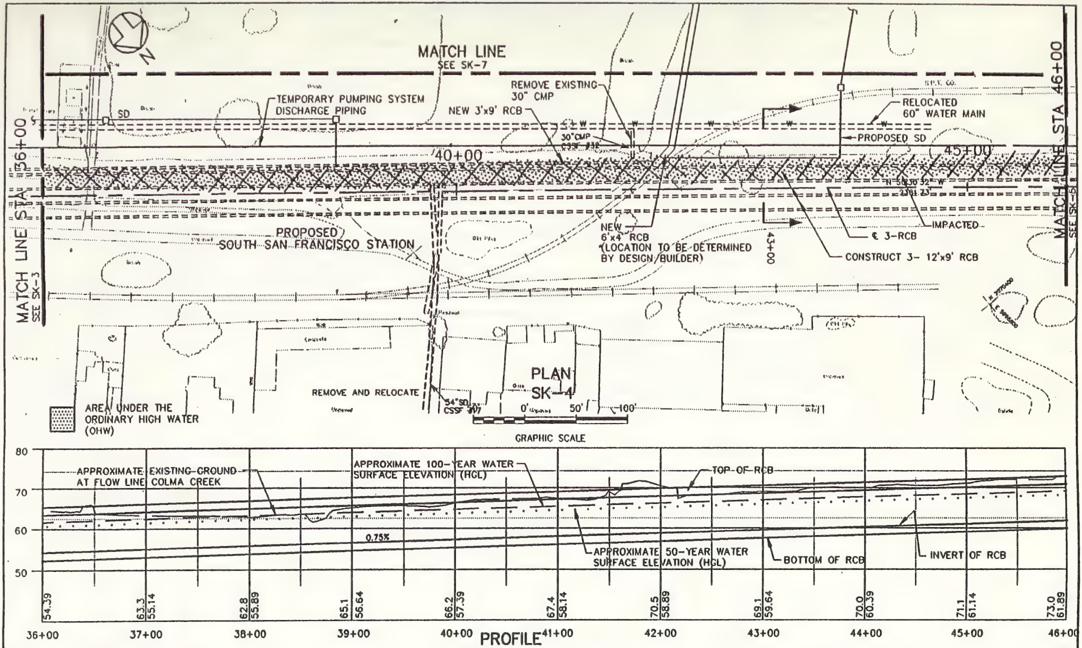
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

PLAN AND PROFILE

SCALE: 1"=100'H; 1"=25'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 8 OF 74 FEBRUARY 1996



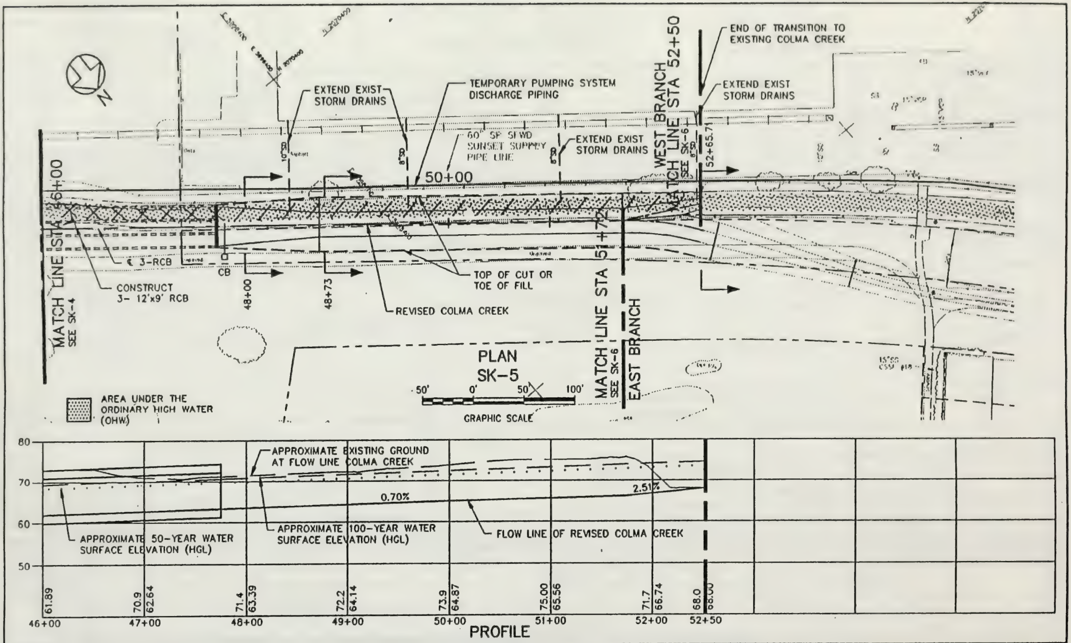
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

PLAN AND PROFILE

SCALE: 1"=100'H; 1"=25'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 9 OF 74 FEBRUARY 1996


EXTEND EXIST STORM DRAINS
TEMPORARY PUMPING SYSTEM DISCHARGE PIPING
60" SF SFWD SUNSET SUPPLY PIPE LINE
EXTEND EXIST STORM DRAINS
END OF TRANSITION TO EXISTING COLMA CREEK
EXTEND EXIST STORM DRAINS
WEST BRANCH
MATCH LINE STA 52+50
SEE SK-6
52+65.71
50+00
MATCH LINE STA 46+00
SEE SK-4
℄ 3-RCB
CONSTRUCT 3- 12'x9' RCB
CB
48+00
48+73
REVISED COLMA CREEK
TOP OF CUT OR TOE OF FILL
MATCH LINE STA 51+72
SEE SK-6
EAST BRANCH
PLAN
SK-5
50'
0'
50'
100'
GRAPHIC SCALE
AREA UNDER THE ORDINARY HIGH WATER (OHW)
80
70
60
50
APPROXIMATE EXISTING GROUND AT FLOW LINE COLMA CREEK
0.70%
2.51%
APPROXIMATE 50-YEAR WATER SURFACE ELEVATION (HGL)
APPROXIMATE 100-YEAR WATER SURFACE ELEVATION (HGL)
FLOW LINE OF REVISED COLMA CREEK
61.89
70.9
62.64
71.4
63.39
72.2
64.14
73.9
64.87
75.00
65.56
71.7
66.74
68.0
68.00
46+00
47+00
48+00
49+00
50+00
51+00
52+00
52+50
PROFILE

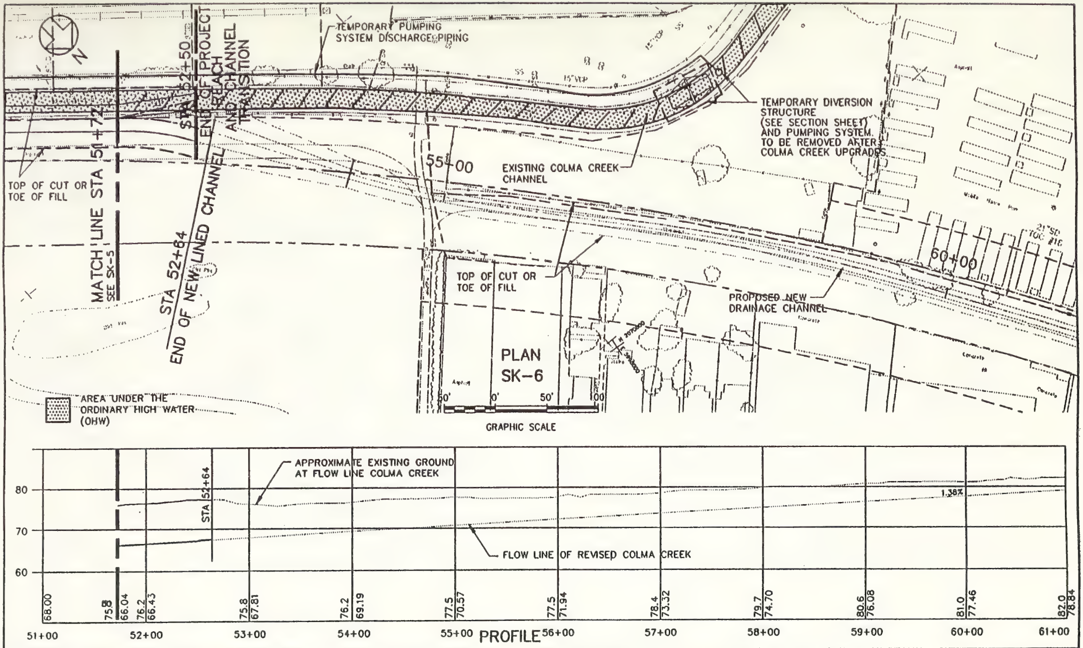
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

PLAN AND PROFILE

SCALE: 1"=100'H; 1"=25'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 10 OF 74 FEBRUARY 1996


N
TEMPORARY PUMPING SYSTEM DISCHARGE PIPING
STA 52+50 END OF PROJECT REACH AND CHANNEL TRANSITION
TEMPORARY DIVERSION STRUCTURE (SEE SECTION SHEET) AND PUMPING SYSTEM. TO BE REMOVED AFTER COLMA CREEK UPGRADES
55+00
EXISTING COLMA CREEK CHANNEL
TOP OF CUT OR TOE OF FILL
MATCH LINE STA 51+72
SEE SK-5
STA 52+64 END OF NEW LINED CHANNEL
TOP OF CUT OR TOE OF FILL
60+00
PROPOSED NEW DRAINAGE CHANNEL
PLAN SK-6
50' 0' 50' 100'
GRAPHIC SCALE
AREA UNDER THE ORDINARY HIGH WATER (OHW)
APPROXIMATE EXISTING GROUND AT FLOW LINE COLMA CREEK
STA 52+64
1.38%
FLOW LINE OF REVISED COLMA CREEK
80
70
60
68.00
75.8
66.04
76.2
66.43
75.8
67.81
76.2
69.19
77.5
70.57
77.5
71.94
78.4
73.32
79.7
74.70
80.6
76.08
81.0
77.46
82.0
78.84
51+00
52+00
53+00
54+00
55+00
PROFILE
56+00
57+00
58+00
59+00
60+00
61+00

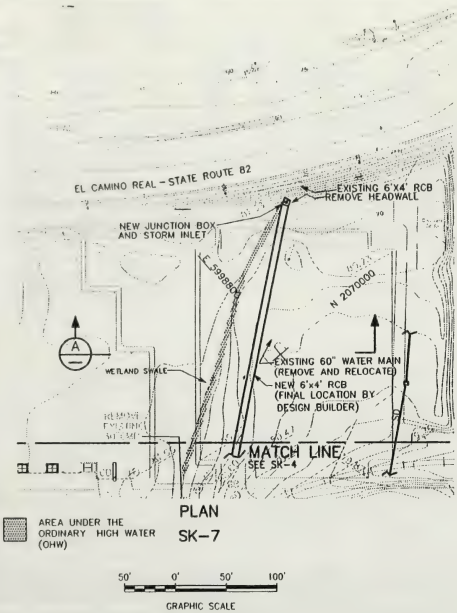
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

PLAN AND PROFILE

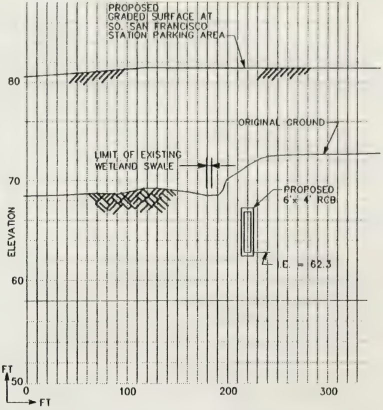
SCALE: 1"=100'H; 1"=25'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 11 OF 74 FEBRUARY 1996



PLAN
SK-7



RCB = REINFORCED CONCRETE BOX

SECTION A
SCALE: 1"=100'(HOR)
1"=10'(VERT)

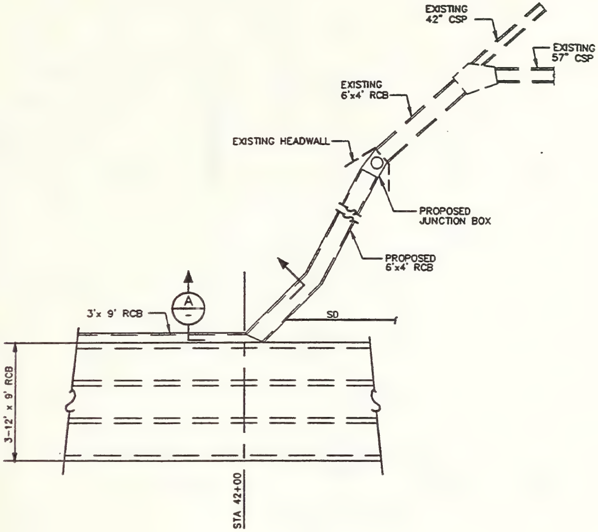
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

PLAN AND PROFILE

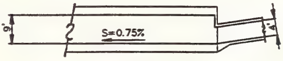
SCALE: AS NOTED

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 12 OF 74 FEBRUARY 1996



PLAN
(SEE SK-4)



SECTION A

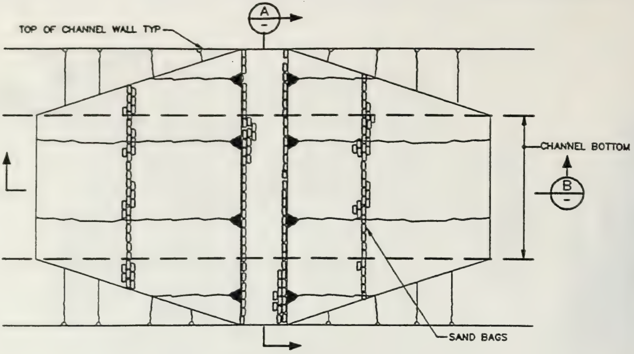
RCB = REINFORCED CONCRETE BOX

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

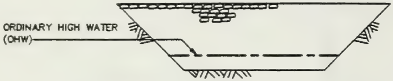
6'X4' RCB
PLAN AND SECTION

SCALE: NTS
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

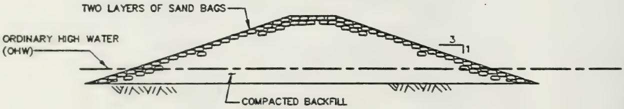
PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 13 OF 74 FEBRUARY 1996



PLAN
(SEE SK-6)



SECTION A



SECTION B

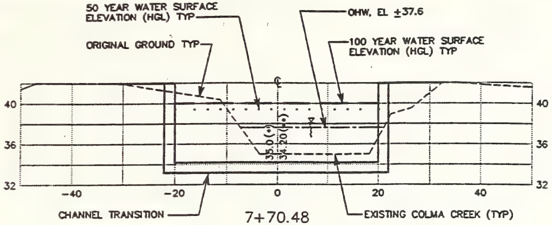
NOTE:

- STRUCTURE WILL BE REMOVED AT PROJECT COMPLETION

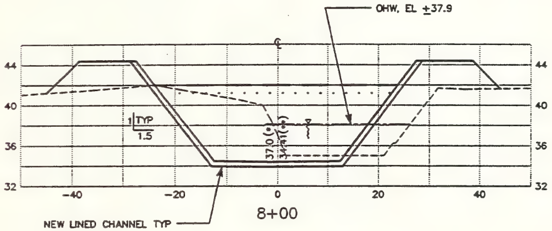
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING

TEMP.* DIVERSION STRUCTURE
PLAN AND SECTIONS
SCALE: NTS
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

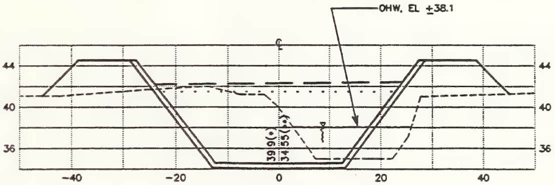
PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 14 OF 74 FEBRUARY 1996


50 YEAR WATER SURFACE ELEVATION (HGL) TYP
OHW, EL ±37.6
ORIGINAL GROUND TYP
100 YEAR WATER SURFACE ELEVATION (HGL) TYP
℄
40
36
32
35.0(•)
34.20(••)
−40
−20
0
20
40
CHANNEL TRANSITION
EXISTING COLMA CREEK (TYP)

7+70.48



8+00



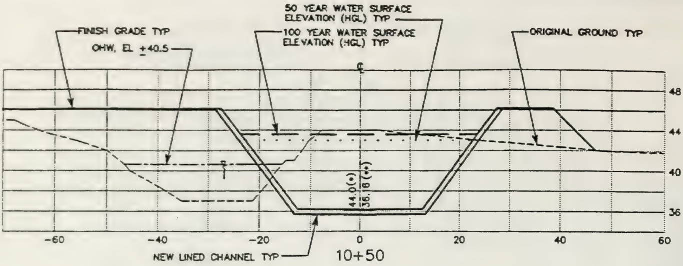
8+20.48

O.G. = ORIGINAL GROUND
OHW = ORDINARY HIGH WATER (PRECONSTRUCTION)
HGL = HYDRAULIC GRADE LINE
(•) O.G. ELEVATION
(••) CHANNEL INVERT ELEVATION
℄ = CENTERLINE OF NEW CHANNEL

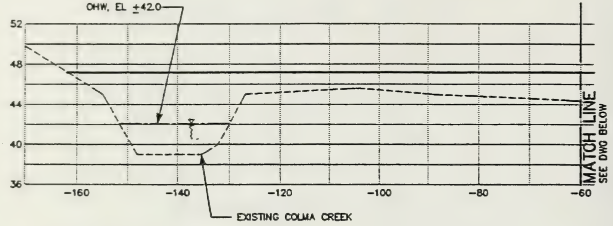
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

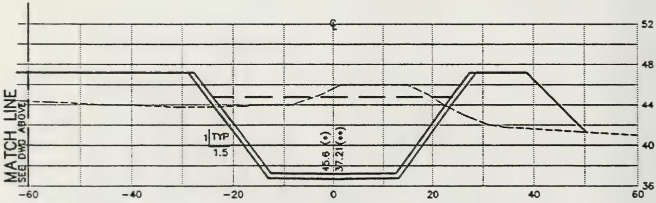
CROSS SECTIONS
SCALE: 1"=20' (HOR)
1"=10' (VERT)
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 15 OF 74 FEBRUARY 1996



10+50





12+00

O.G. = ORIGINAL GROUND
OHW = ORDINARY HIGH WATER (PRECONSTRUCTION)
HGL = HYDRAULIC GRADE LINE
(•) O.G ELEVATION
(••) CHANNEL INVERT ELEVATION
℄ = CENTERLINE OF NEW CHANNEL

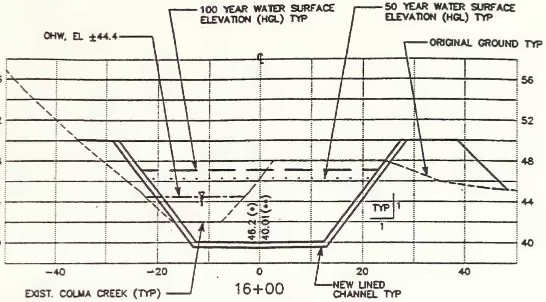
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING

CROSS SECTIONS

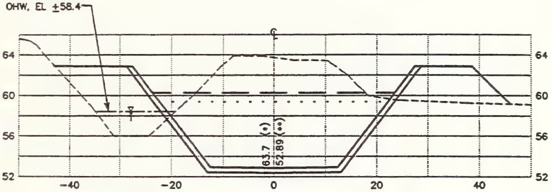
SCALE: 1"=20' (HOR)
1"=10' (VERT)

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

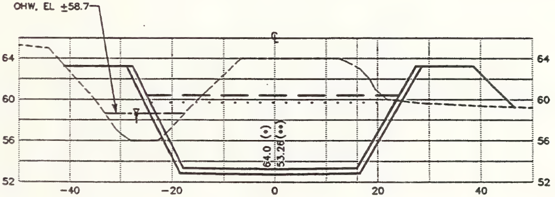
PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 16 OF 74 FEBRUARY 1996



16+00



34+00



34+50

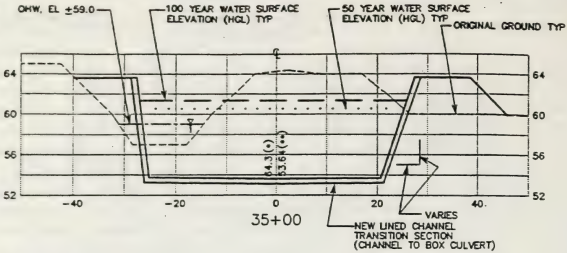
O.G. = ORIGINAL GROUND
OHW = ORDINARY HIGH WATER (PRECONSTRUCTION)
HGL = HYDRAULIC GRADE LINE
(•) O.G. ELEVATION
(••) CHANNEL INVERT ELEVATION
℄ = CENTERLINE OF NEW CHANNEL

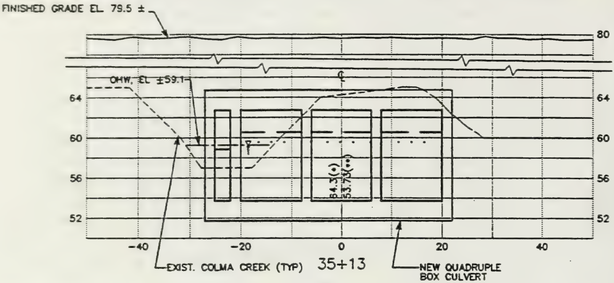
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

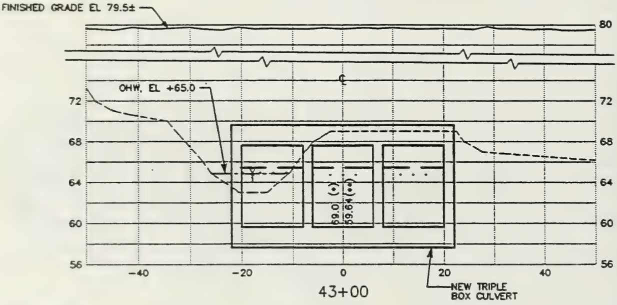
CROSS SECTIONS

SCALE: 1"=20'(HOR)
1"=10'(VERT)
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 17 OF 74 FEBRUARY 1996


OHW, EL ±59.0
100 YEAR WATER SURFACE ELEVATION (HGL) TYP
50 YEAR WATER SURFACE ELEVATION (HGL) TYP
ORIGINAL GROUND TYP
℄
64
60
56
52
64.3(•)
53.64(••)
VARIES
-40
-20
0
20
40
35+00
NEW LINED CHANNEL TRANSITION SECTION (CHANNEL TO BOX CULVERT)





O.G. = ORIGINAL GROUND
OHW = ORDINARY HIGH WATER (PRECONSTRUCTION)
HGL = HYDRAULIC GRADE LINE
(•) O.G. ELEVATION
(••) CHANNEL INVERT ELEVATION
℄ = CENTERLINE OF NEW CHANNEL

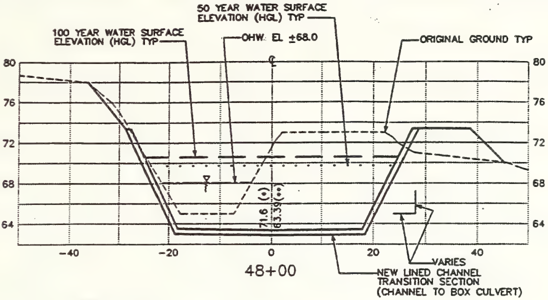
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING

CROSS SECTIONS

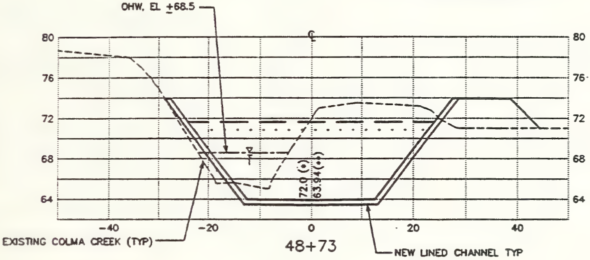
SCALE: 1"=20'(HOR)
1"=10'(VERT)

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

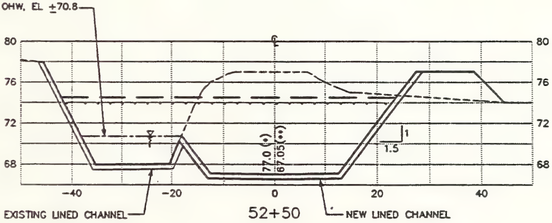
PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 18 OF 74 FEBRUARY 1996


50 YEAR WATER SURFACE ELEVATION (HGL) TYP
100 YEAR WATER SURFACE ELEVATION (HGL) TYP
OHW EL ±68.0
ORIGINAL GROUND TYP
80
76
72
68
64
-40
-20
0
20
40
71.6 (•)
63.39(••)
VARIES
NEW LINED CHANNEL TRANSITION SECTION (CHANNEL TO BOX CULVERT)

48+00



48+73



52+50

O.G. = ORIGINAL GROUND
OHW = ORDINARY HIGH WATER (PRECONSTRUCTION)
HGL = HYDRAULIC GRADE
(•) O.G. ELEVATION
(••) CHANNEL INVERT ELEVATION
℄ = CENTERLINE OF NEW CHANNEL

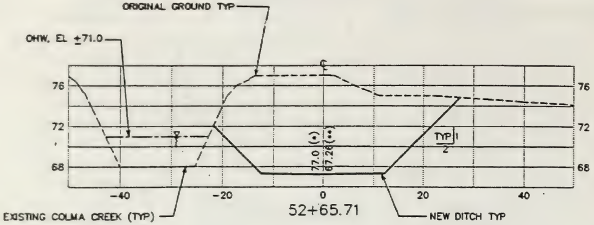
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

CROSS SECTIONS

SCALE: 1"=20' (HOR)
1"=10' (VERT)

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 19 OF 74 FEBRUARY 1996



O.G. = ORIGINAL GROUND
OHW = ORDINARY HIGH WATER (PRECONSTRUCTION)
HGL = HYDRAULIC GRADE
(•) O.G. ELEVATION
(••) CHANNEL INVERT ELEVATION
℄ = CENTERLINE OF NEW CHANNEL

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

CROSS SECTIONS

SCALE: 1"=20' (HOR)
1"=10' (VERT)

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 20 OF 74 FEBRUARY 1996

COLMA CREEK REVISED ALIGNMENT
QUANTITIES

ITEM	Area Required For Wetland Replacement (Ac)	Fill (CY) (Below OHW)	Excavation (CY) (Below OHW)
Existing Colma Creek Channel (Sta 7+70 to 52+50). Ordinary High Water (OHW) as shown in the attached Cross Section sheets.	——	530	980
Box culvert replacing existing Colma Creek under the South San Francisco Station (Sta 35+10 to 47+70, x 16' OHW)	0.46	——	——
Quantities at swale under the South San Francisco Station parking area (300' x 5' x 1')	0.03	55	——
PERMANENT IMPACT TOTALS:	**0.49**	**585**	**980**

Temporary dam for Colma Creek bypass	——	20	——

Purpose:

Provide Rapid Transit
Service To San Francisco
International Airport

Datum:

Not Applicable

Adjacent Property Owners:

See Attached Listing

QUANTITIES

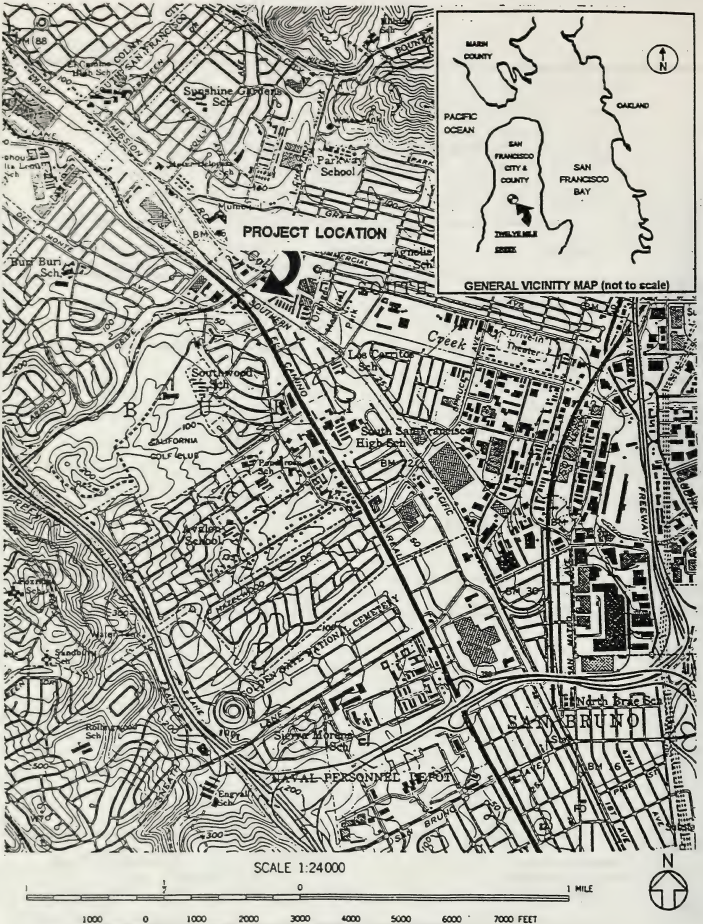
SCALE: NOT APPLICABLE

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FL
P. O. BOX 58
OAKLAND, CA 94604

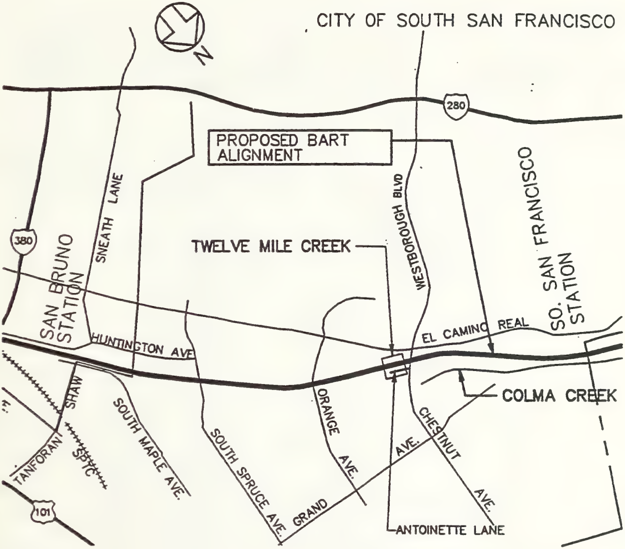
Proposed BART Alignment
In:
At:

County of: SAN MATEO
State: CALIFORNIA
Application by: BART

Sheet 21 of 74 February 1996



PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT DATUM: NGVD 1929 ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING	TWELVE MILE CREEK VICINITY MAP SCALE: 1"=2000' BAY AREA RAPID TRANSIT DISTRICT 1000 BROADWAY, 4TH FLOOR P.O. BOX 58 OAKLAND, CA 94607	PROPOSED BART ALIGNMENT IN: AT: COUNTY OF: SAN MATEO STATE: CALIFORNIA APPLICATION BY: BART SHEET: 22 OF 74 FEBRUARY 1996



PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT

DATUM: NGVD 1929

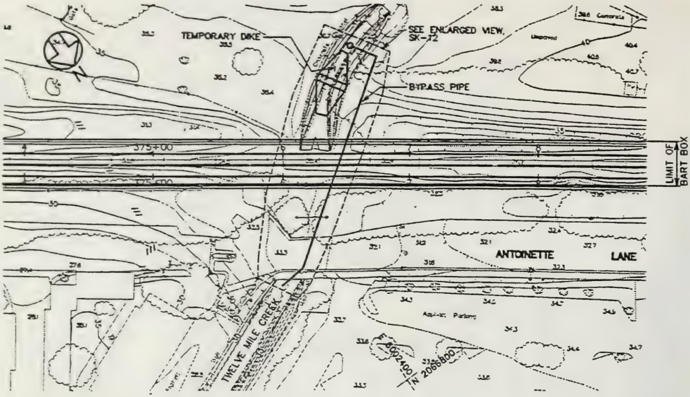
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

LOCATION PLAN

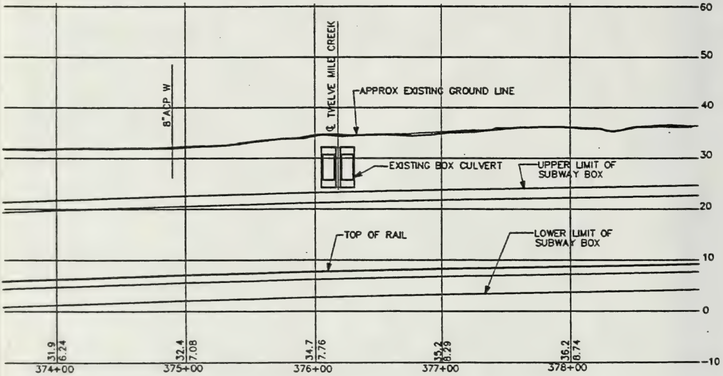
SCALE: NTS

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 23 OF 74 FEBRUARY 1996



PLAN
SK-11
SCALE: 1"=80'



PROFILE
SCALE: 1"=80'(H)
1"=20'(V)

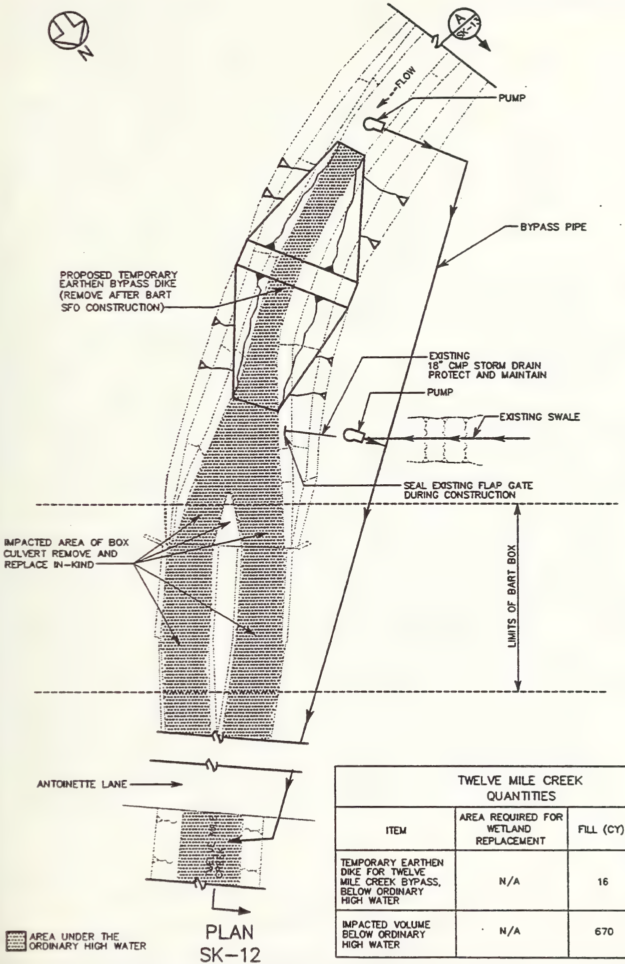
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

PLAN AND PROFILE

SCALE: AS NOTED

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 24 OF 74 FEBRUARY 1996


N
A
SK-13
FLOW
PUMP
BYPASS PIPE
PROPOSED TEMPORARY EARTHEN BYPASS DIKE (REMOVE AFTER BART SFO CONSTRUCTION)
EXISTING 18" CMP STORM DRAIN PROTECT AND MAINTAIN
PUMP
EXISTING SWALE
SEAL EXISTING FLAP GATE DURING CONSTRUCTION
IMPACTED AREA OF BOX CULVERT REMOVE AND REPLACE IN-KIND
LIMITS OF BART BOX
ANTOINETTE LANE
▨ AREA UNDER THE ORDINARY HIGH WATER

PLAN
SK-12

TWELVE MILE CREEK QUANTITIES

ITEM	AREA REQUIRED FOR WETLAND REPLACEMENT	FILL (CY)	EXCAVATION (CY)
TEMPORARY EARTHEN DIKE FOR TWELVE MILE CREEK BYPASS, BELOW ORDINARY HIGH WATER	N/A	16	NONE
IMPACTED VOLUME BELOW ORDINARY HIGH WATER	N/A	670	670

PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT

DATUM: NGVD 1929

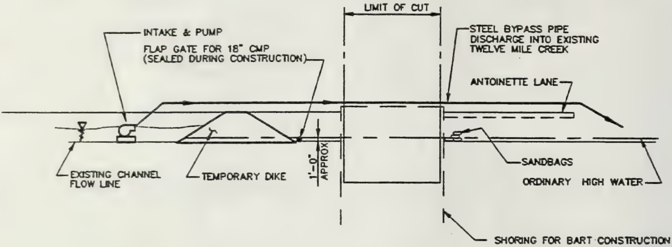
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

ENLARGED VIEW

SCALE: 1"=20'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 25 OF 74 FEBRUARY 1996


LIMIT OF CUT
INTAKE & PUMP
FLAP GATE FOR 18" CMP (SEALED DURING CONSTRUCTION)
STEEL BYPASS PIPE DISCHARGE INTO EXISTING TWELVE MILE CREEK
ANTOINETTE LANE
SANDBAGS
ORDINARY HIGH WATER
EXISTING CHANNEL FLOW LINE
TEMPORARY DIKE
1'-0" APPROX
SHORING FOR BART CONSTRUCTION

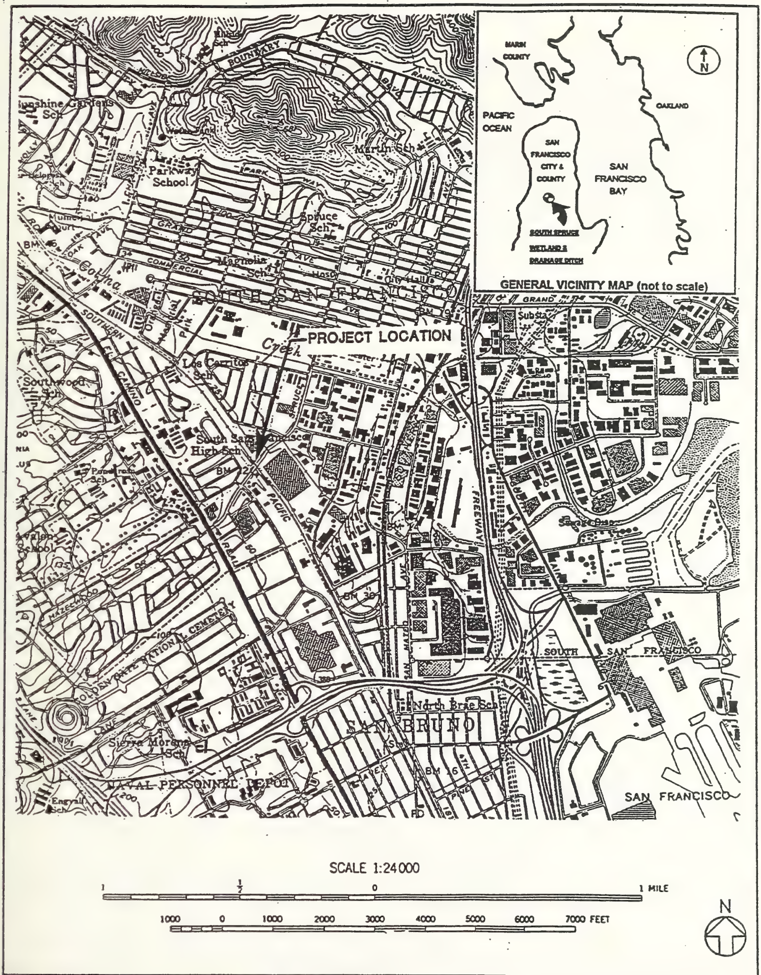
SECTION (A / SK-12)
NTS

SK-13

PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: N/A
ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING

SECTION
SCALE: NTS
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 26 OF 74 FEBRUARY 1996



PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT

DATUM: NGVD 1929

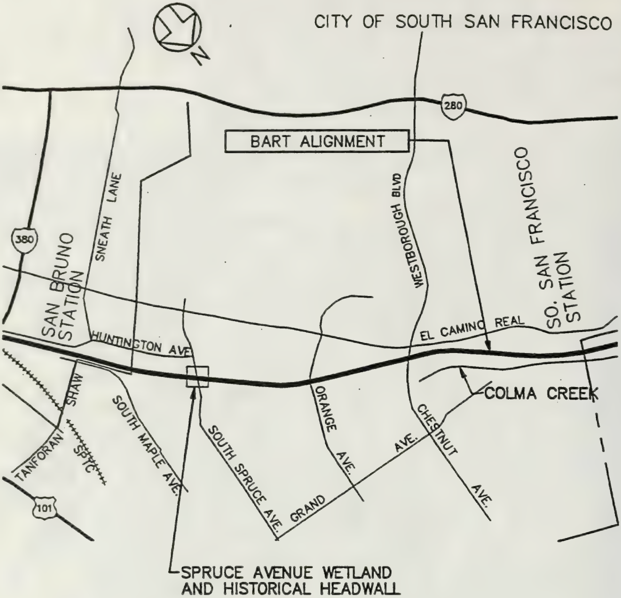
ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING

SO. SPRUCE AVE. WETLAND VICINITY MAP

SCALE: NTS

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 27 OF 74 FEBRUARY 1996



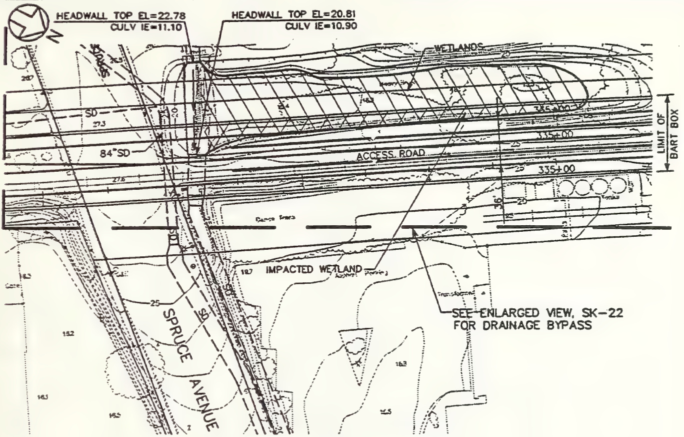
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

LOCATION PLAN

SCALE: NTS

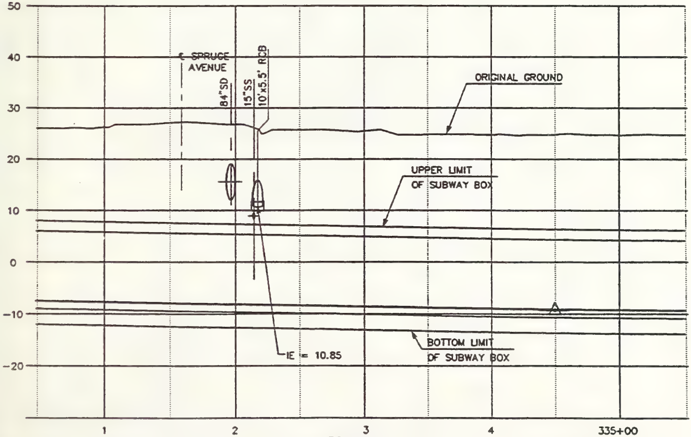
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 28 OF 74 FEBRUARY 1996



PLAN
SK-21

GRAPHIC SCALE



PROFILE

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

SEE ATTACHED LISTING

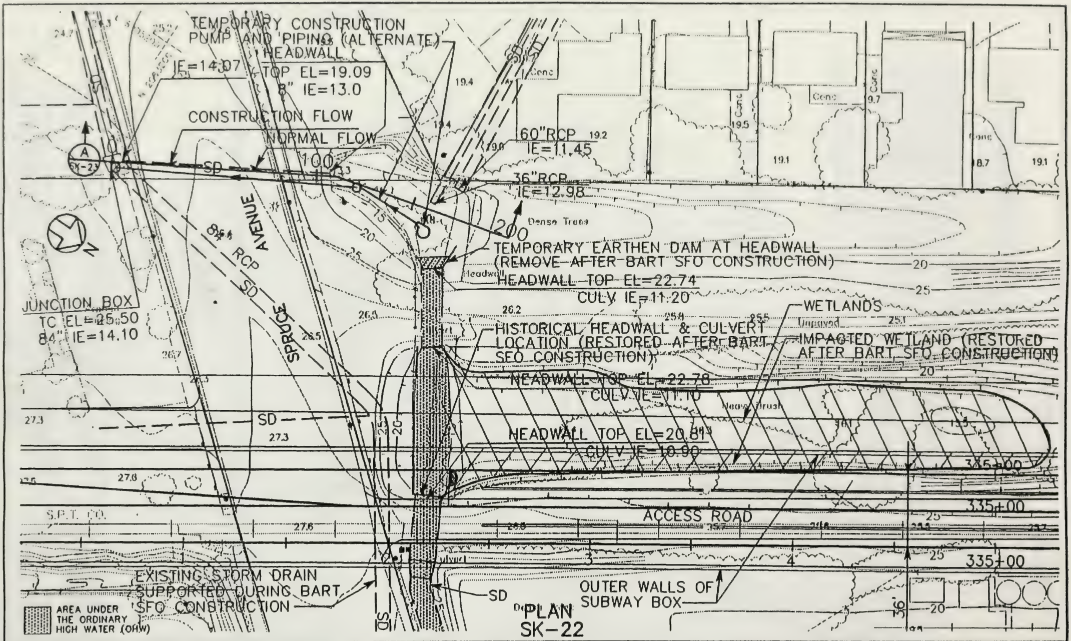
PLAN AND PROFILE

SCALE: 1"=80'H
1"=20'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 29 OF 74 FEBRUARY 1996



TEMPORARY CONSTRUCTION PUMP AND PIPING (ALTERNATE)
HEADWALL
TOP EL=19.09
8" IE=13.0
IE=14.07
CONSTRUCTION FLOW
NORMAL FLOW
A
SK-23
SD
100
200
60"RCP
IE=11.45
36"RCP
IE=12.98
Dense Trees
AVENUE
84" RCP
SD
SPRUCE
JUNCTION BOX
TC EL=25.50
84" IE=14.10
TEMPORARY EARTHEN DAM AT HEADWALL (REMOVE AFTER BART SFO CONSTRUCTION)
HEADWALL TOP EL=22.74
CULV IE=11.20
HISTORICAL HEADWALL & CULVERT LOCATION (RESTORED AFTER BART SFO CONSTRUCTION)
WETLANDS
IMPACTED WETLAND (RESTORED AFTER BART SFO CONSTRUCTION)
HEADWALL TOP EL=22.78
CULV IE=11.10
HEADWALL TOP EL=20.81
CULV IE=10.90
Heavy Brush
335+00
ACCESS ROAD
S.P.T. CO.
EXISTING STORM DRAIN SUPPORTED DURING BART SFO CONSTRUCTION
SD
OUTER WALLS OF SUBWAY BOX
PLAN
SK-22
AREA UNDER THE ORDINARY HIGH WATER (OHW)

PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

SEE ATTACHED LISTING

ENLARGED VIEW

SCALE: 1"=50'

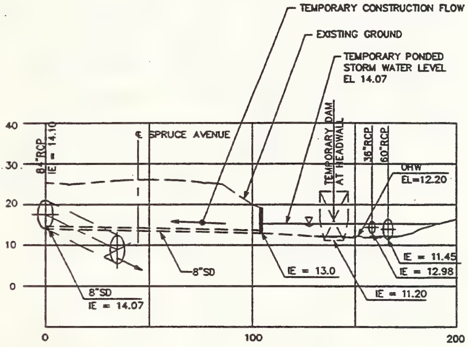
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 30 OF 74 FEBRUARY 1996

SOUTH SPRUCE AVENUE WETLAND QUANTITIES

ITEM	AREA REQUIRED FOR WETLAND REPLACEMENT (AC)	FILL (CY)	EXCAVATION (CY)
PERMANENTLY IMPACTED WETLAND AREA	NONE	N/A	N/A
IMPACTED VOLUME BELOW ORDINARY HIGH WATER	N/A	1,750	1,750
TEMPORARY EARTHEN DAM AT HEADWALL BELOW OHW	N/A	2.0	–



SECTION A SK-22

OHW = ORDINARY HIGH WATER

SK-23

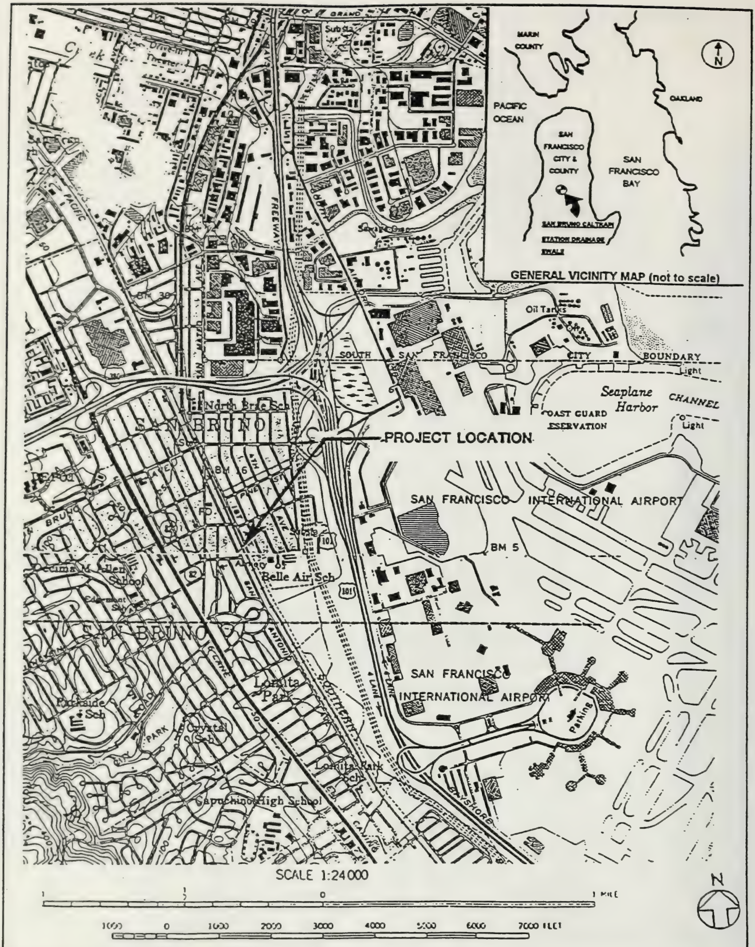
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

SEE ATTACHED LISTING

SECTION
SCALE: 1"=50' H
1"=25' V
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

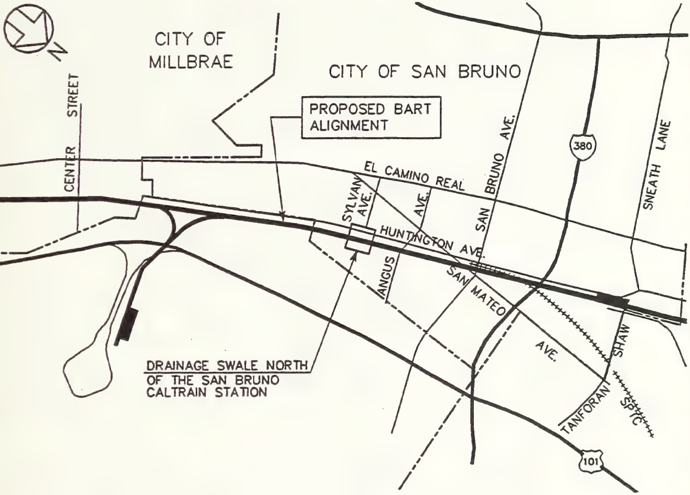
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 31 OF 74 FEBRUARY 1996



PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

SAN BRUNO DRAINAGE SWALE
VICINITY MAP
SCALE: 1"=2000'
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 32 OF 74 FEBRUARY 1996



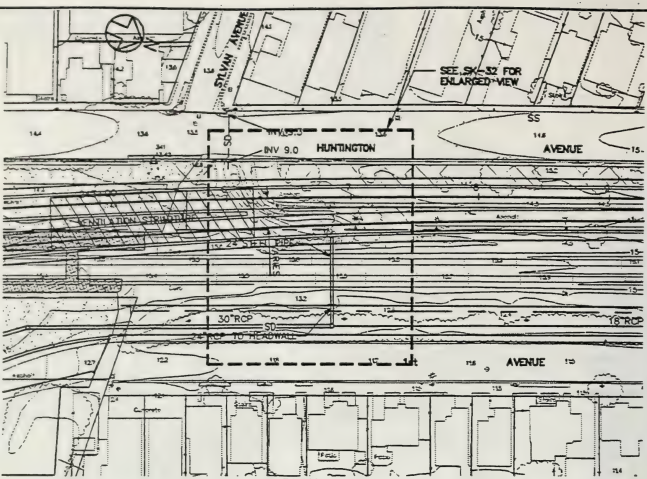
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

LOCATION PLAN

SCALE: NTS

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 33 OF 74 FEBRUARY 1996

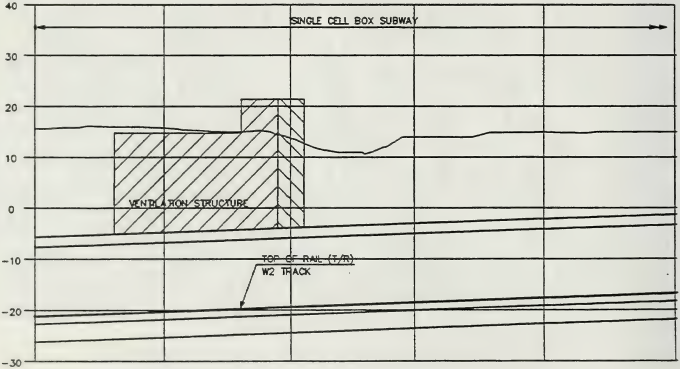


PLAN

SK-31

80' 0' 80'

GRAPHIC SCALE



PROFILE

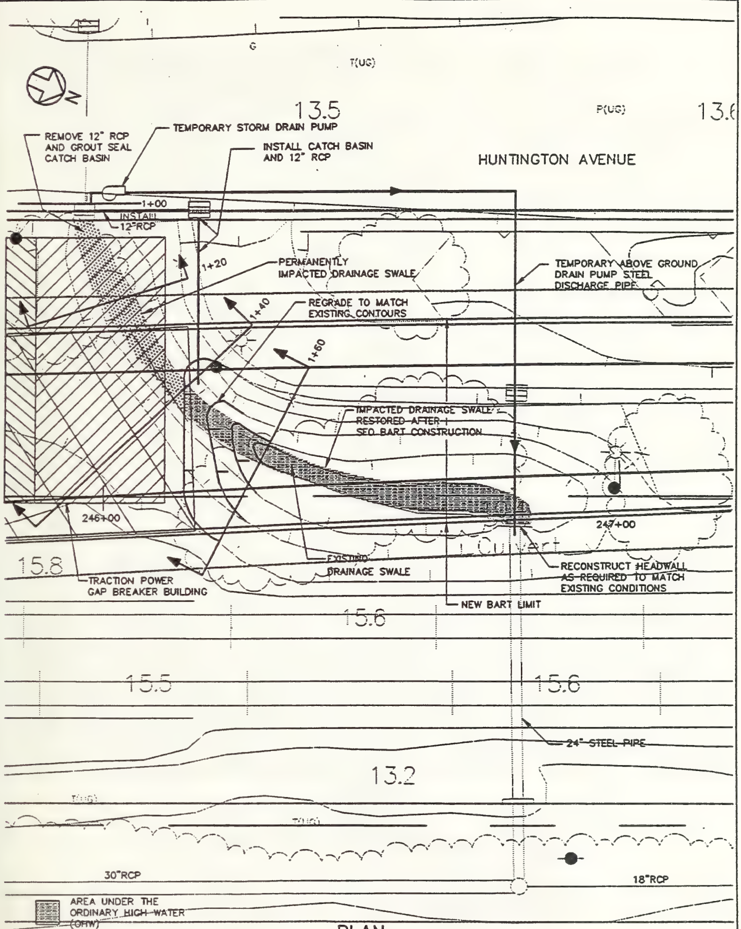
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

PLAN AND PROFILE

SCALE: 1"=80'H; 1"=20'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 34 OF 74 FEBRUARY 1996


T(UG)
G
13.5
P(UG)
13.
HUNTINGTON AVENUE
REMOVE 12" RCP AND GROUT SEAL CATCH BASIN
TEMPORARY STORM DRAIN PUMP
INSTALL CATCH BASIN AND 12" RCP
1+00
INSTALL 12" RCP
1+20
PERMANENTLY IMPACTED DRAINAGE SWALE
TEMPORARY ABOVE GROUND DRAIN PUMP STEEL DISCHARGE PIPE
1+40
REGRADE TO MATCH EXISTING CONTOURS
1+60
~~IMPACTED DRAINAGE SWALE RESTORED AFTER SFO BART CONSTRUCTION~~
246+00
247+00
Culvert
15.8
EXISTING DRAINAGE SWALE
RECONSTRUCT HEADWALL ~~AS REQUIRED TO MATCH~~ EXISTING CONDITIONS
TRACTION POWER GAP BREAKER BUILDING
NEW BART LIMIT
15.6
15.5
15.6
~~24" STEEL PIPE~~
13.2
T(UG)
T(UG)
30"RCP
18"RCP
AREA UNDER THE ~~ORDINARY HIGH WATER~~ (OHW)

PLAN
SK–32

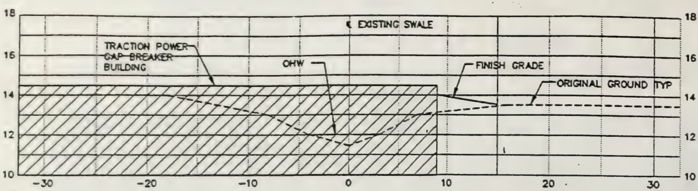
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

ENLARGED VIEW

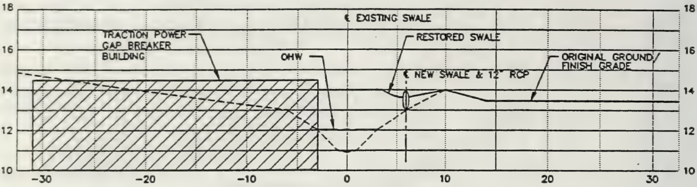
SCALE: 1"=20'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

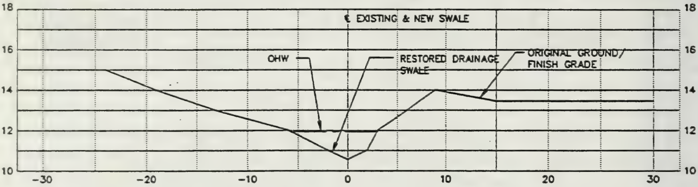
PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 35 OF 74 FEBRUARY 1996



1+20



1+40



1+60

SAN BRUNO CALTRAIN STATION QUANTITIES

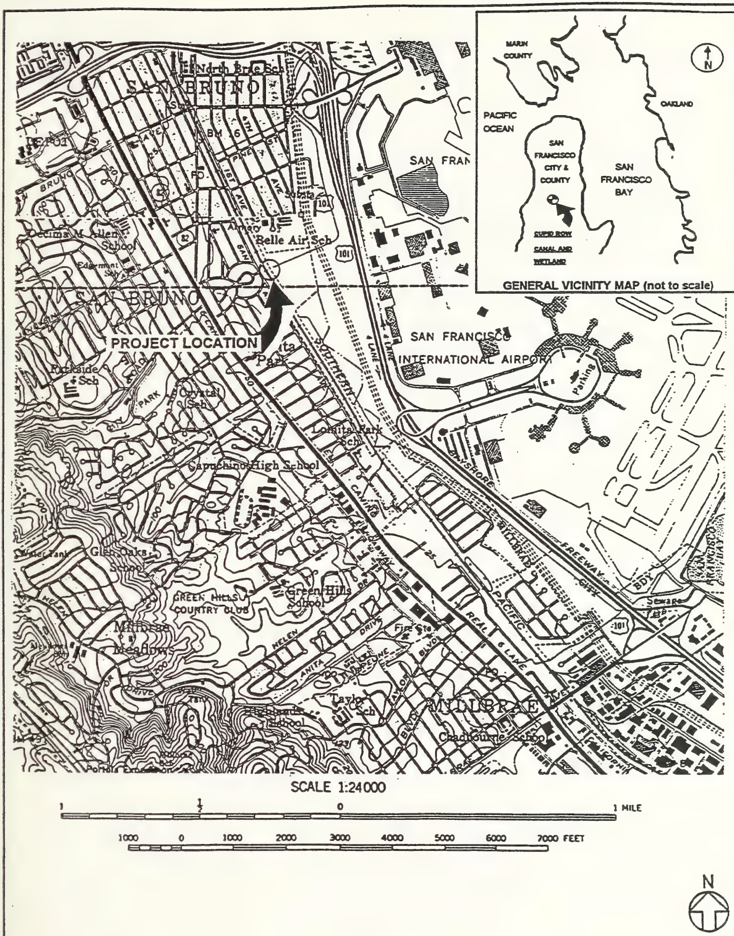
ITEM	AREA REQUIRED FOR WETLAND REPLACEMENT (AC)	FILL (CY)	EXCAVATION (CY)
PERMANENTLY IMPACTED WETLAND AREA	N/A	N/A	N/A
PERMANENTLY IMPACTED WATERS OF THE U.S.	0.01	N/A	N/A
IMPACTED VOLUME BELOW ORDINARY HIGH WATER	N/A	720	713

SK−33

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

CROSS SECTIONS
SCALE: 1"=10'(HOR)
1"=5'(VERT)
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 36 OF 74 FEBRUARY 1996



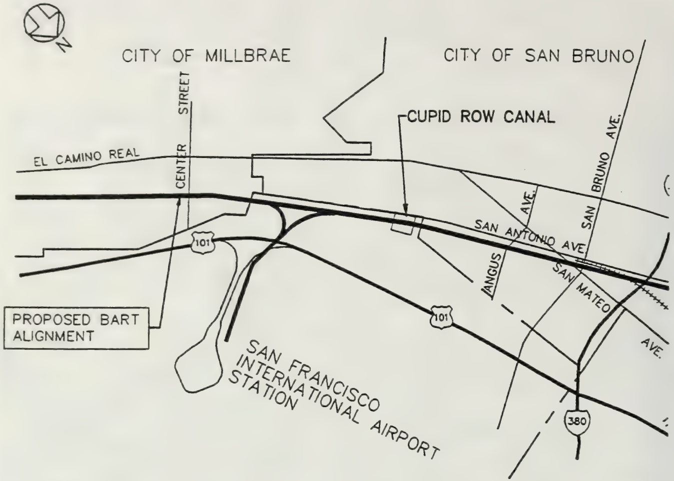
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT

DATUM: NGVD 1929

ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

CUPID ROW CANAL
VICINITY MAP
SCALE: 1"=2000'
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 37 OF 74 FEBRUARY 1996



PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT

DATUM: NGVD 1929

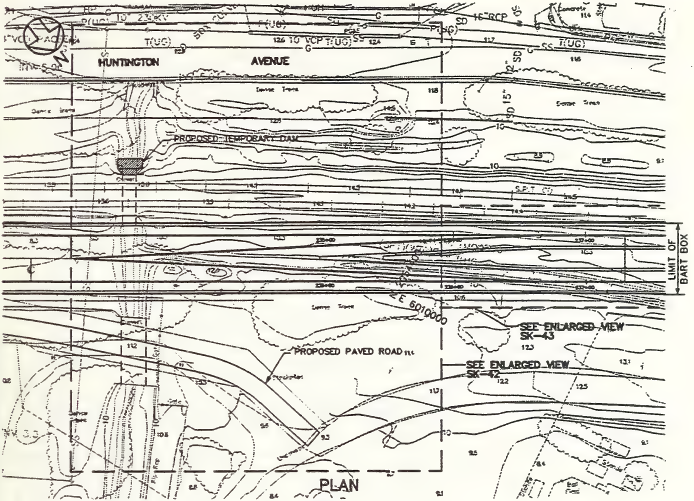
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

LOCATION PLAN

SCALE: NTS

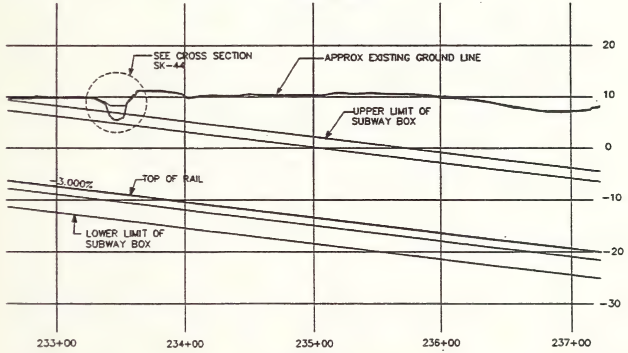
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 38 OF 74 FEBRUARY 199



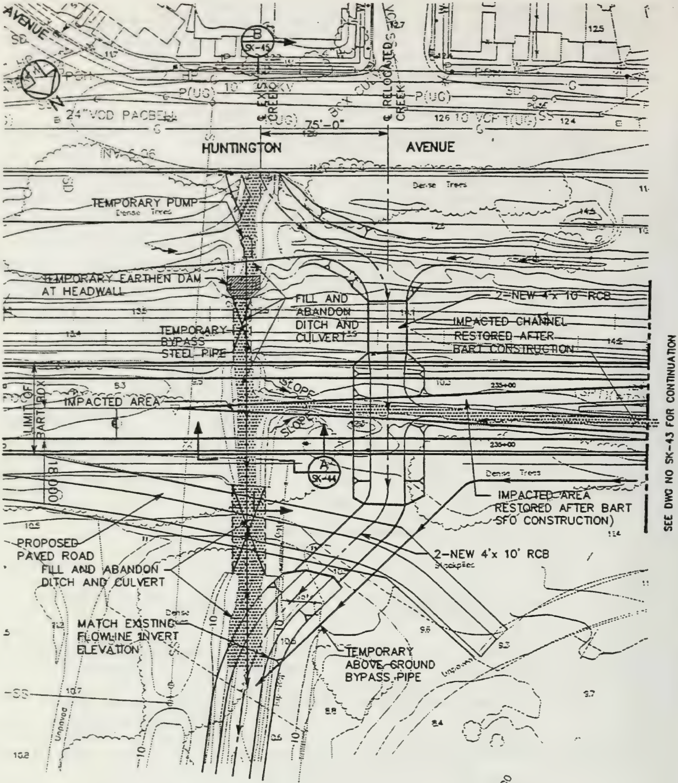
PLAN
SK-41

80' 0' 80'
GRAPHIC SCALE



PROFILE

PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT DATUM: NGVD 1929 ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING	PLAN AND PROFILE SCALE: 1"=80'(H) 1"=20'(V) BAY AREA RAPID TRANSIT DISTRICT 1000 BROADWAY, 4TH FLOOR P.O. BOX 58 OAKLAND, CA 94607	PROPOSED BART ALIGNMENT IN: AT: COUNTY OF: SAN MATEO STATE: CALIFORNIA APPLICATION BY: BART SHEET: 39 OF 74 FEBRUARY 1996


AVENUE
SD
B
SK-45
24" VCD PACBELL
P(UG)
EXIST. CREEK
RELOCATED CREEK
BOX CULVERT
75'-0"
HUNTINGTON
AVENUE
10" VCP T(UG)
SS
G
TEMPORARY PUMP
Dense Trees
TEMPORARY EARTHEN DAM AT HEADWALL
FILL AND ABANDON DITCH AND CULVERT
2-NEW 4'x 10' RCB
IMPACTED CHANNEL RESTORED AFTER BART CONSTRUCTION
TEMPORARY BYPASS STEEL PIPE
LIMIT OF BART BOX
SLOPE
IMPACTED AREA
235+00
A
SK-44
18.000
IMPACTED AREA RESTORED AFTER BART SFO CONSTRUCTION)
PROPOSED PAVED ROAD
FILL AND ABANDON DITCH AND CULVERT
2-NEW 4'x 10' RCB
Stockpiles
MATCH EXISTING FLOWLINE INVERT ELEVATION
TEMPORARY ABOVE GROUND BYPASS PIPE
Unpaved
SEE DWG NO SK-43 FOR CONTINUATION

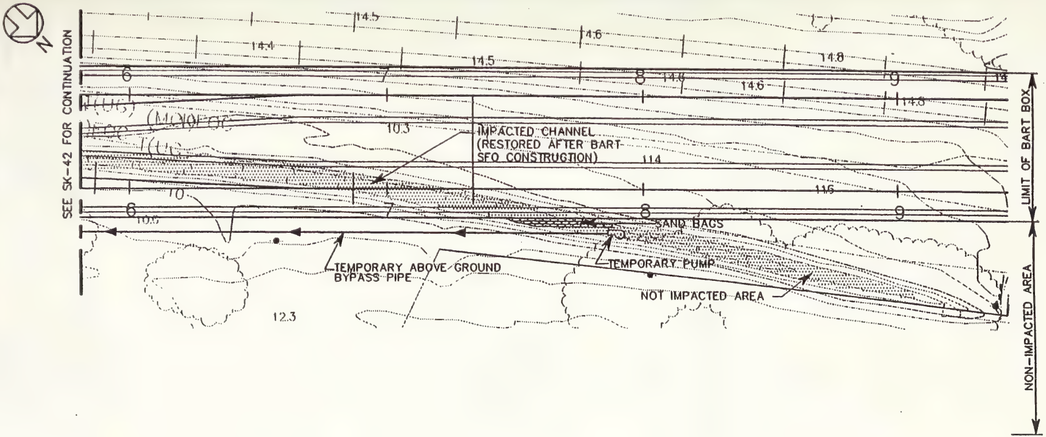
PLAN
SK-42

▨ AREA UNDER THE ORDINARY HIGH WATER

PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

ENLARGED VIEW
SCALE: 1"=60'
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 40 OF 74 FEBRUARY 1996



▨ AREA UNDER THE ORDINARY HIGH WATER (OHW)

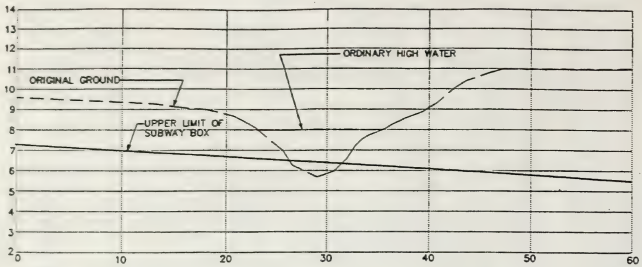
SK-43

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

ENLARGED VIEW
SCALE: 1"=40'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 41 OF 74 FEBRUARY 1996



SECTION A SK-42

SCALE: 1"=10' (HOR)
1"=5" (VERT)

CUPID ROW CANAL QUANTITIES

ITEM	AREA REQUIRED FOR WETLAND REPLACEMENT (AC)	FILL (CY)	EXCAVATION (CY)
PERMANENTLY IMPACTED WETLAND AREA	NONE	N/A	N/A
PERMANENTLY IMPACTED WATERS OF THE U.S	0.01	N/A	N/A
IMPACTED VOLUME BELOW ORDINARY HIGH WATER	N/A	117	0
TEMPORARY EARTHEN DAM AT HEADWALL BELOW OHW	N/A	10	0

SK–44

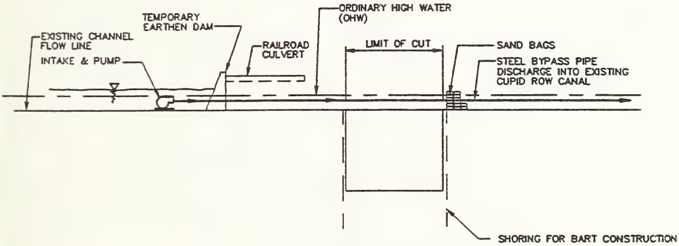
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

DITCH CROSS–SECTION

SCALE: AS SHOWN

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 42 OF 74 FEBRUARY 1996


TEMPORARY EARTHEN DAM
ORDINARY HIGH WATER (OHW)
EXISTING CHANNEL FLOW LINE
INTAKE & PUMP
RAILROAD CULVERT
LIMIT OF CUT
SAND BAGS
STEEL BYPASS PIPE DISCHARGE INTO EXISTING CUPID ROW CANAL
SHORING FOR BART CONSTRUCTION

SECTION B
NTS SK-42

SK-45

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

CROSS SECTION

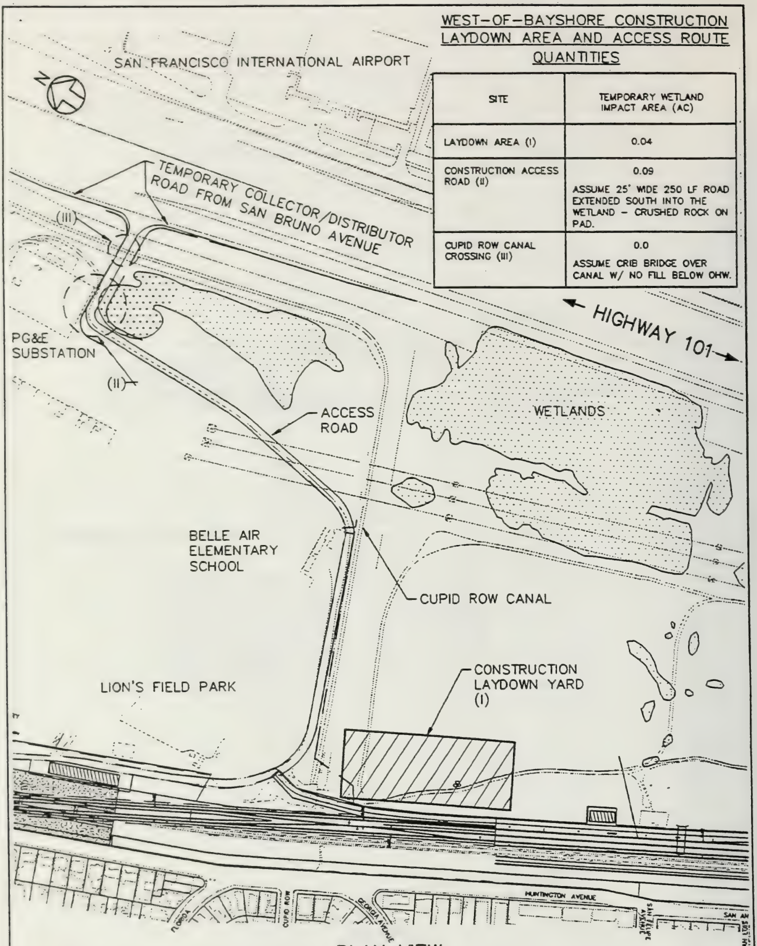
SCALE: NTS

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 43 OF 74 FEBRUARY 1996

WEST-OF-BAYSHORE CONSTRUCTION LAYDOWN AREA AND ACCESS ROUTE QUANTITIES

SITE	TEMPORARY WETLAND IMPACT AREA (AC)
LAYDOWN AREA (I)	0.04
CONSTRUCTION ACCESS ROAD (II)	0.09 ASSUME 25' WIDE 250 LF ROAD EXTENDED SOUTH INTO THE WETLAND - CRUSHED ROCK ON PAD.
CUPID ROW CANAL CROSSING (III)	0.0 ASSUME CRIB BRIDGE OVER CANAL W/ NO FILL BELOW OHW.



PLAN VIEW

PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

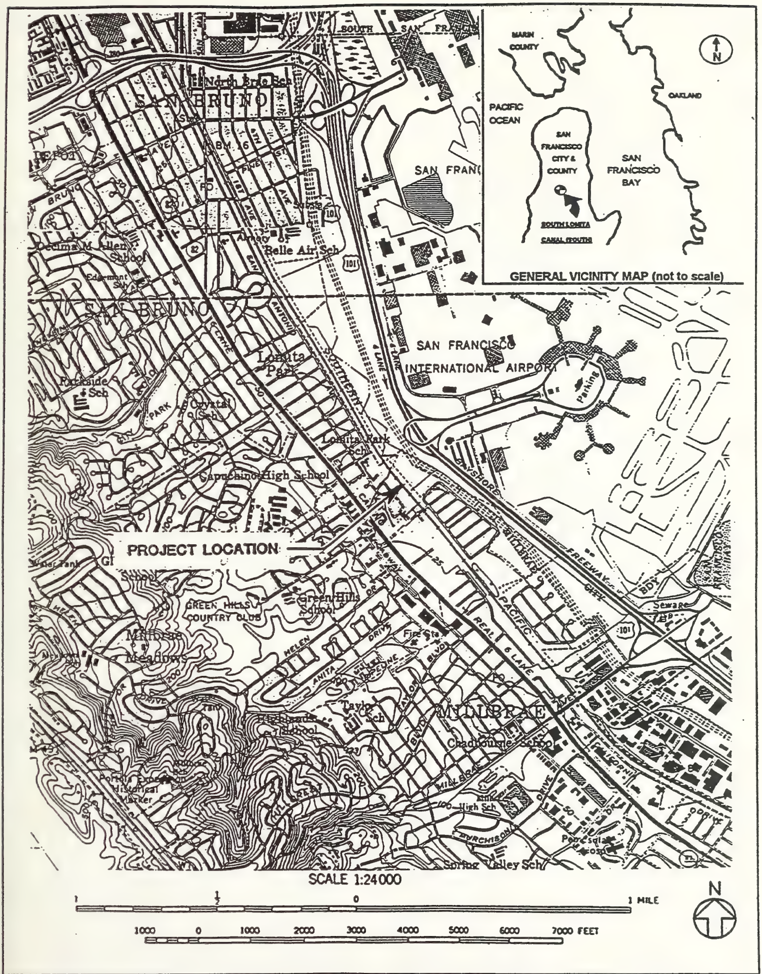
SEE ATTACHED LISTING

TEMPORARY LAYDOWN YARD

SCALE: 1"=300'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 43A OF 74 FEBRUARY 1996



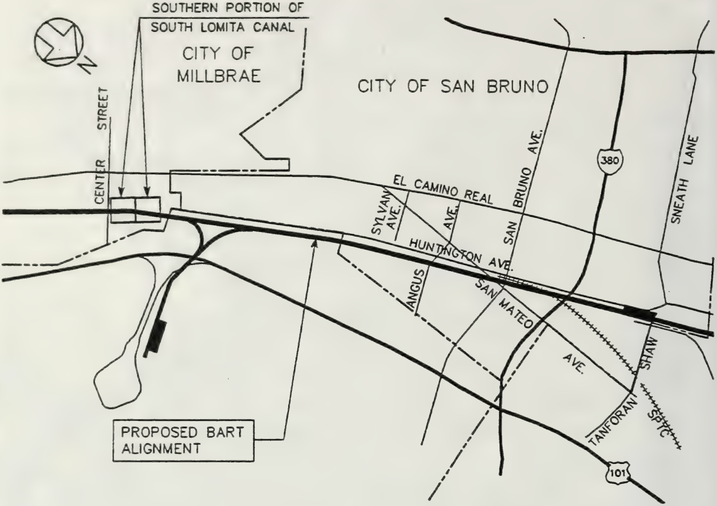
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

SOUTH LOMITA CANAL (SOUTH)
VICINITY MAP

SCALE: 1"=2000'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 44 OF 74 FEBRUARY 1996



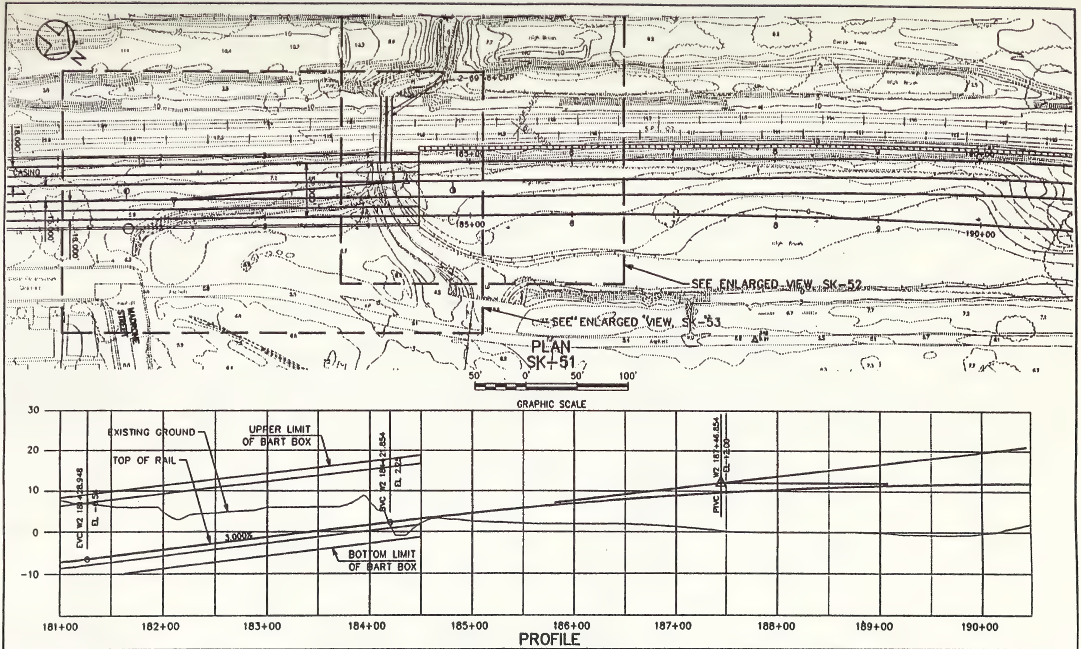
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

LOCATION PLAN

SCALE: NTS

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 45 OF 74 FEBRUARY 1996



PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO
SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

SEE ATTACHED LISTING

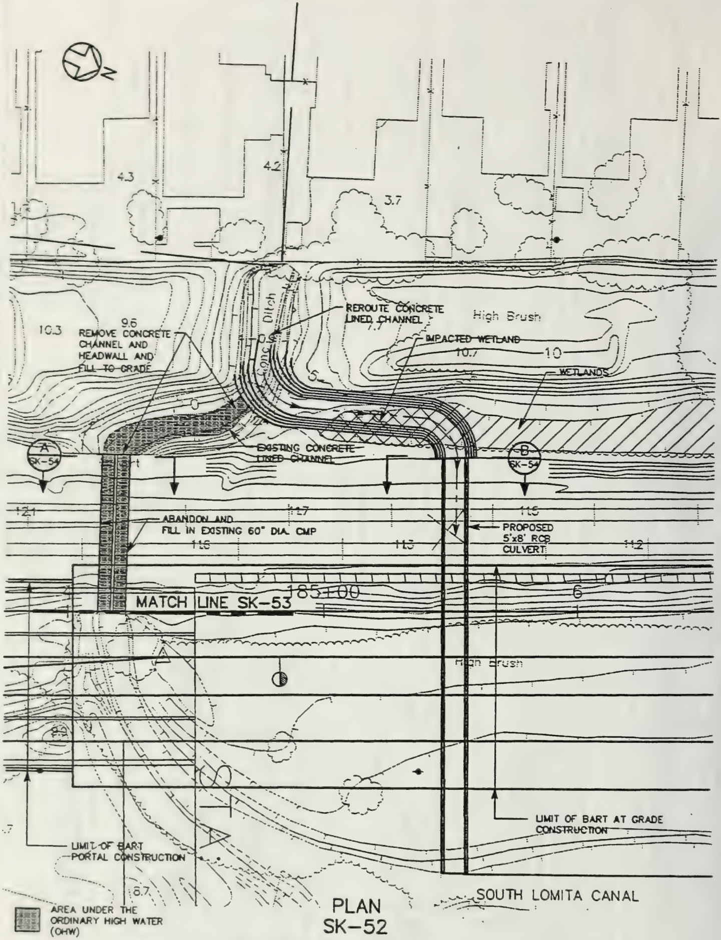
PLAN AND PROFILE

SCALE: 1"=100'H
1"=25'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 46 OF 74 FEBRUARY 1996


4.3
4.2
3.7
10.3
9.6
REMOVE CONCRETE CHANNEL AND HEADWALL AND FILL TO GRADE
Conc. Ditch
REROUTE CONCRETE LINED CHANNEL
High Brush
IMPACTED WETLAND
10.7
10
WETLANDS
EXISTING CONCRETE LINED CHANNEL
A SK-54
B SK-54
12.1
11.7
11.6
ABANDON AND FILL IN EXISTING 60" DIA. CMP
11.8
11.3
PROPOSED 5'x8' RCB CULVERT
11.2
185+00
6
MATCH LINE SK-53
High Brush
8.9
LIMIT OF BART AT GRADE CONSTRUCTION
LIMIT OF BART PORTAL CONSTRUCTION
8.7
SOUTH LOMITA CANAL
AREA UNDER THE ORDINARY HIGH WATER (OHW)

PLAN
SK-52

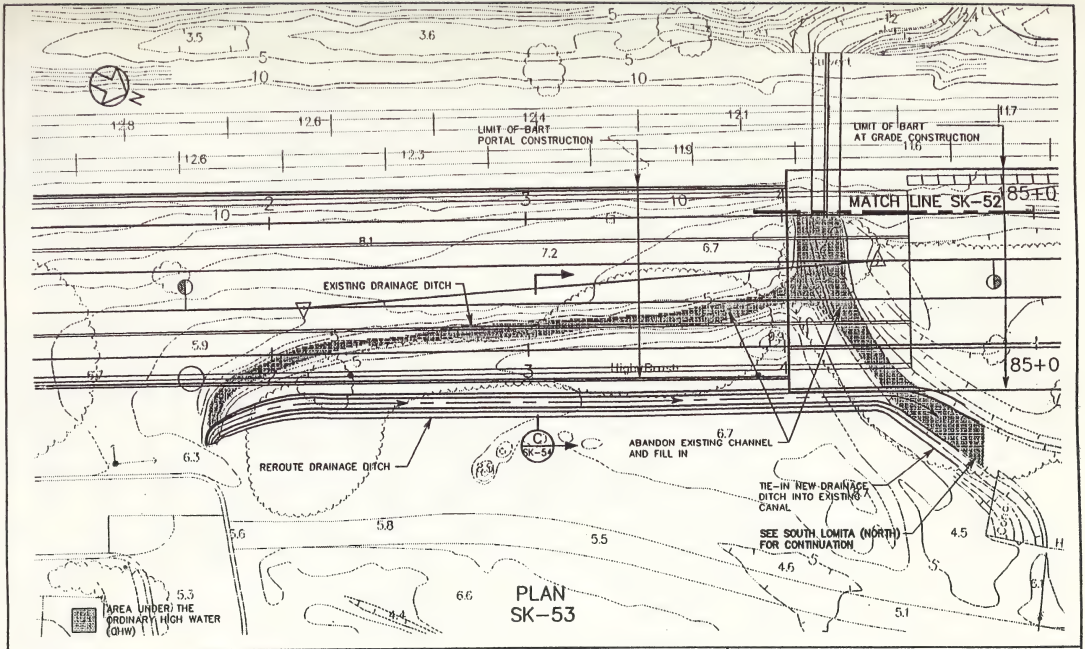
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

ENLARGED VIEW

SCALE: 1"=40'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 47 OF 74 FEBRUARY 1996



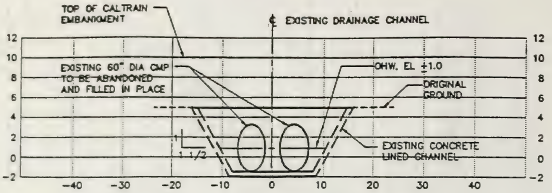
PLAN
SK-53

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

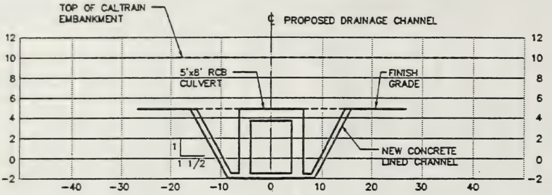
ENLARGED VIEW
SCALE: 1"=40'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

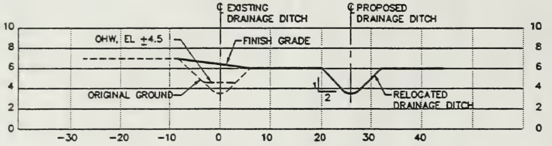
PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 48 OF 74 FEBRUARY 1996


TOP OF CALTRAIN EMBANKMENT
℄ EXISTING DRAINAGE CHANNEL
EXISTING 60" DIA CMP TO BE ABANDONED AND FILLED IN PLACE
OHW, EL ±1.0
ORIGINAL GROUND
EXISTING CONCRETE LINED CHANNEL
1
1 1/2
12
10
8
6
4
2
0
−2
−40
−30
−20
−10
0
10
20
30
40

SECTION A SK-52


TOP OF CALTRAIN EMBANKMENT
℄ PROPOSED DRAINAGE CHANNEL
5'x8' RCB CULVERT
FINISH GRADE
NEW CONCRETE LINED CHANNEL
1
1 1/2
12
10
8
6
4
2
0
−2
−40
−30
−20
−10
0
10
20
30
40

SECTION B SK-52



SECTION C SK-53

LOMITA CANAL (SOUTH) QUANTITIES

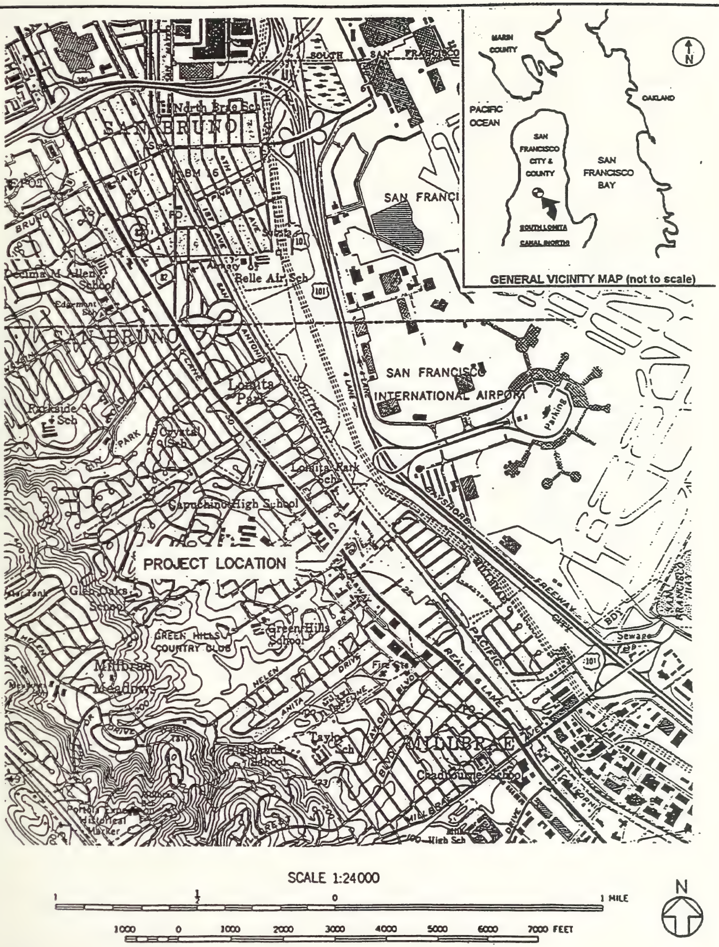
ITEM	AREA REQUIRED FOR WETLAND REPLACEMENT (AC)	FILL (CY)	EXCAVATION (CY)
PERMANENTLY IMPACTED WETLAND AREA	0.02	N/A	N/A
PERMANENTLY IMPACTED WATERS OF THE U.S.	0.02	N/A	N/A
IMPACTED VOLUME BELOW ORDINARY HIGH WATER	N/A	147	-

SK-54

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

SECTIONS
SCALE: 1"=20'(HOR)
1"=10'(VERT)
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 49 OF 74 FEBRUARY 1995



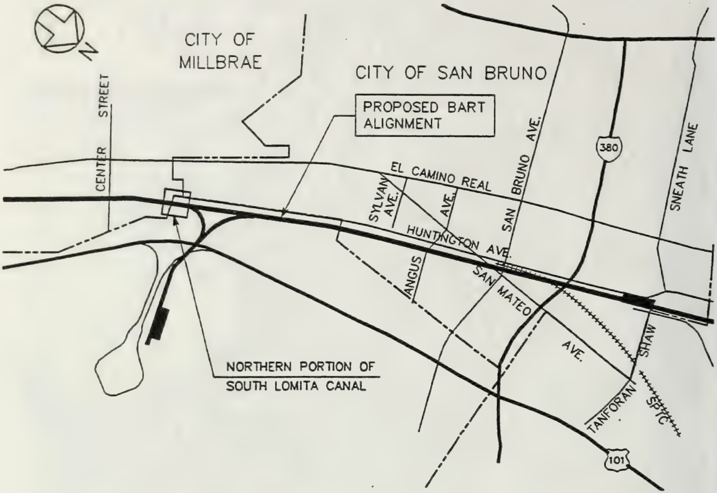
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING

SOUTH LOMITA CANAL (NORTH) VICINITY MAP

SCALE: 1"=2000'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 50 OF 74 FEBRUARY



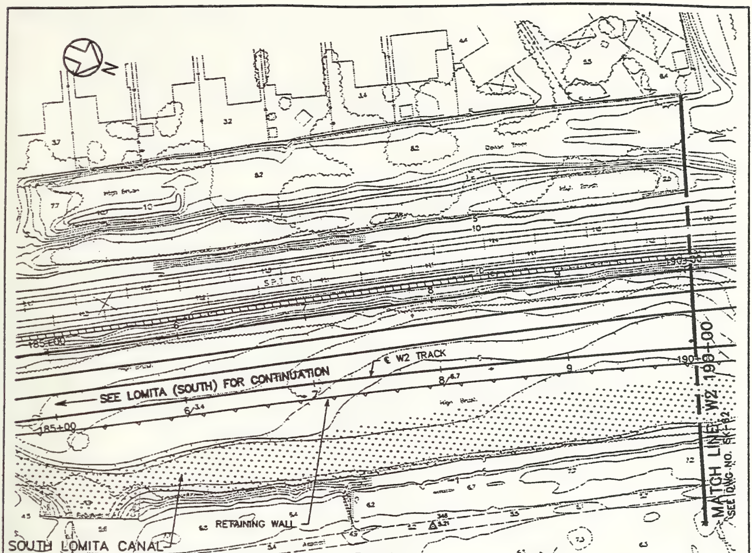
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

LOCATION PLAN

SCALE: NTS

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 51 OF 74 FEBRUARY 1996

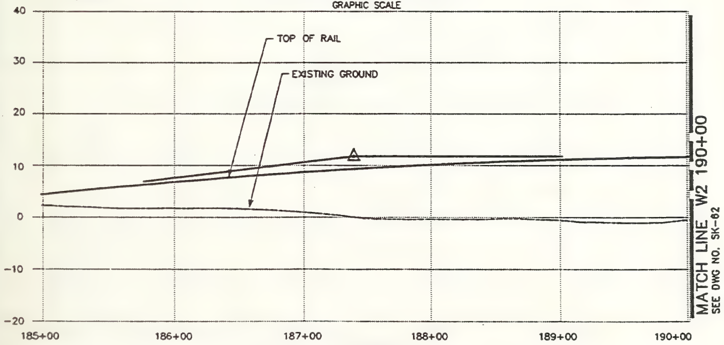


PLAN
SK-61

░ AREA UNDER THE ORDINARY HIGH WATER (OHW)

80' 0' 80'

GRAPHIC SCALE



PROFILE

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

SEE ATTACHED LISTING

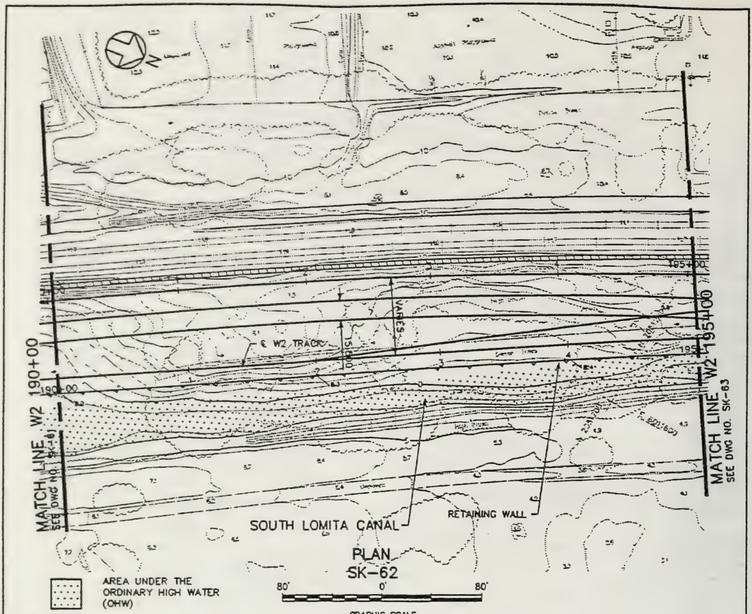
PLAN AND PROFILE

SCALE: 1"=80'H
1"=20'V

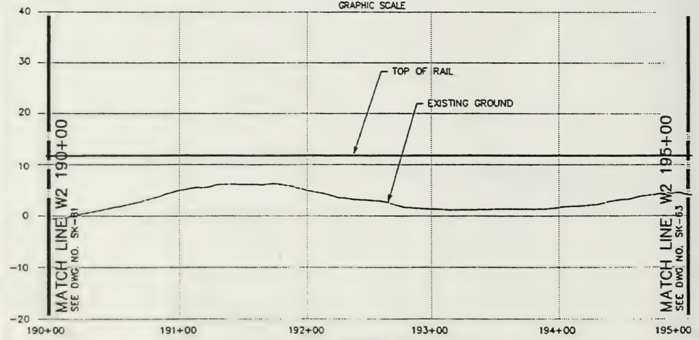
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 52 OF 74 FEBRUARY 1996



PLAN
SK-62



PROFILE

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

SEE ATTACHED LISTING

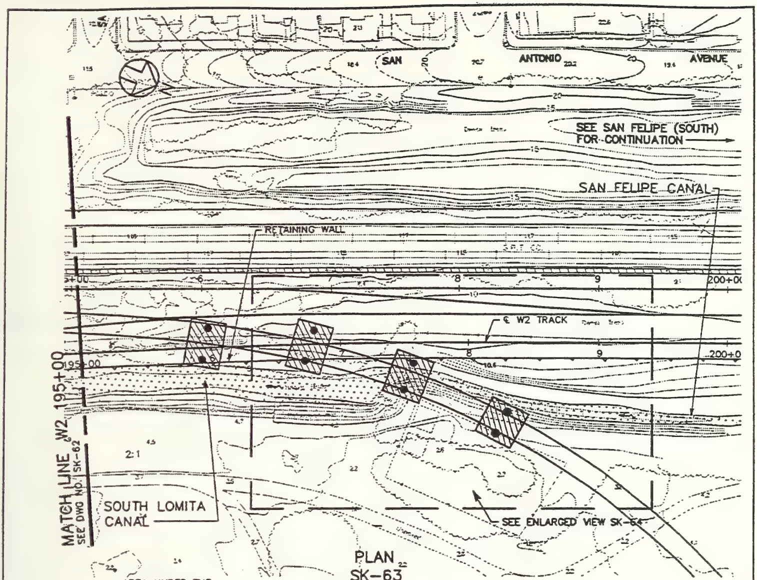
PLAN AND PROFILE

SCALE: 1"=80'H
1"=20'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O BOX 58
OAKLAND, CA 94607

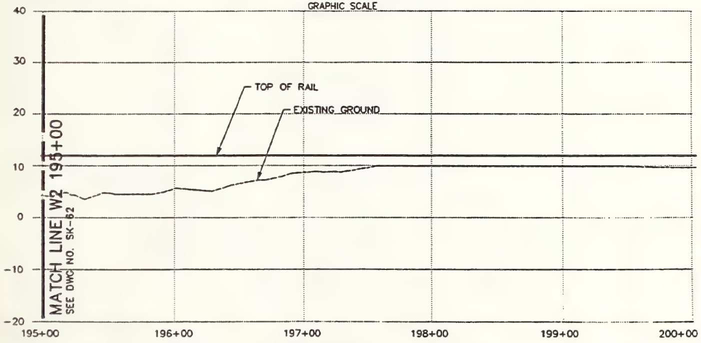
PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 53 OF 74 FEBRUARY 1996



PLAN
SK-63

▒ AREA UNDER THE ORDINARY HIGH WATER (OHW)



PROFILE

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

SEE ATTACHED LISTING

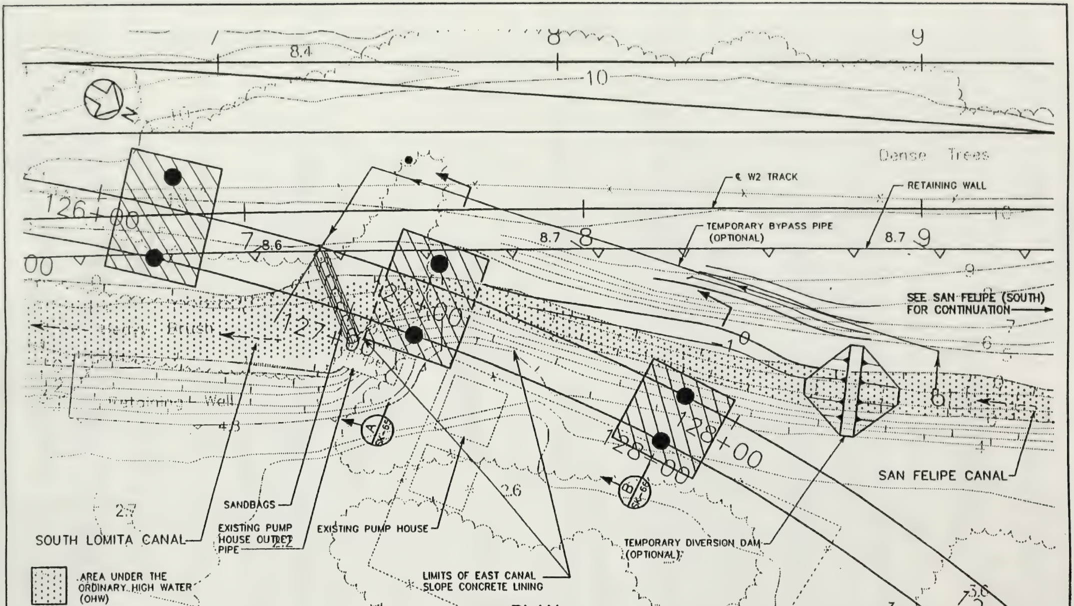
PLAN AND PROFILE

SCALE: 1"=80'H
1"=20'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 54 OF 74 FEBRUARY 1996



PLAN
SK-64

PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

SEE ATTACHED LISTING

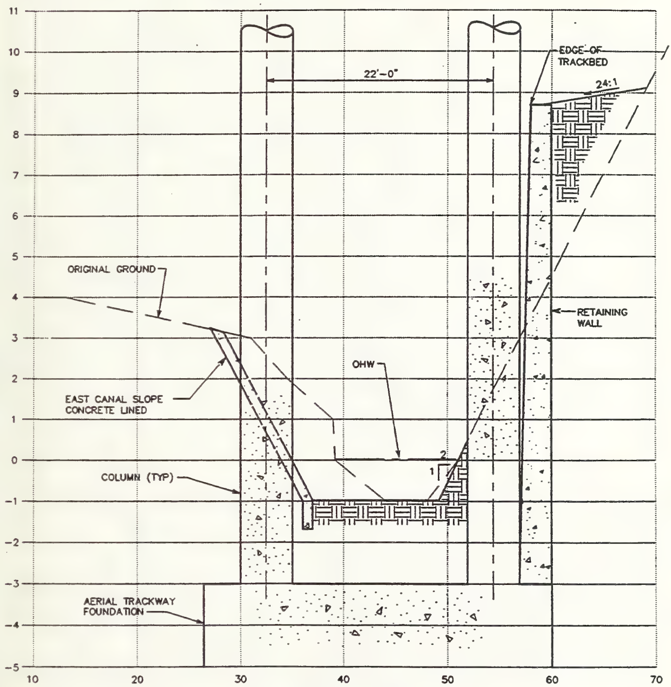
ENLARGED VIEW

SCALE: 1"=30'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 55 OF 74 FEBRUARY 1996



SECTION A SK-64

OHW = ORDINARY HIGH WATER

SK–65

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

SEE ATTACHED LISTING

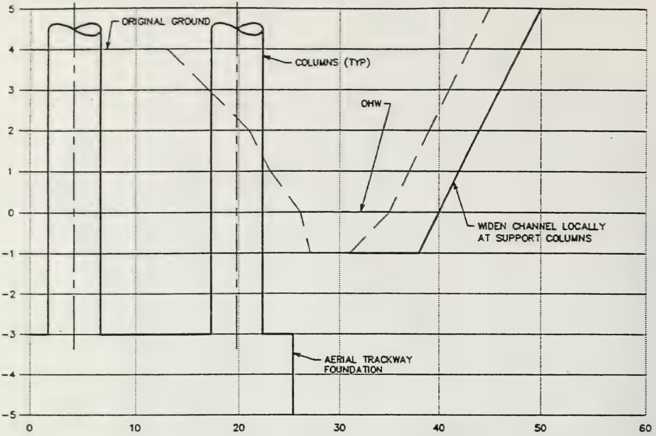
SECTIONS

SCALE: 1"=10'H
1"=2.5'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 56 OF 74 FEBRUARY 1996


ORIGINAL GROUND
COLUMNS (TYP)
OHW
WIDEN CHANNEL LOCALLY AT SUPPORT COLUMNS
AERIAL TRACKWAY FOUNDATION
5
4
3
2
1
0
−1
−2
−3
−4
−5
0
10
20
30
40
50
60

OHW = ORDINARY HIGH WATER

SECTION B SK-64

SOUTH LOMITA CANAL (NORTHERN PORTION) QUANTITIES

ITEM	AREA REQUIRED FOR WETLAND REPLACEMENT (AC)	FILL (CY)	EXCAVATION (CY)
PERMANENTLY IMPACTED WETLAND AREA	NONE	N/A	N/A
IMPACTED VOLUME BELOW ORDINARY HIGH WATER	N/A	134	211
TEMPORARY EARTHEN DAM BELOW ORDINARY HIGH WATER	N/A	10	0

SK−66

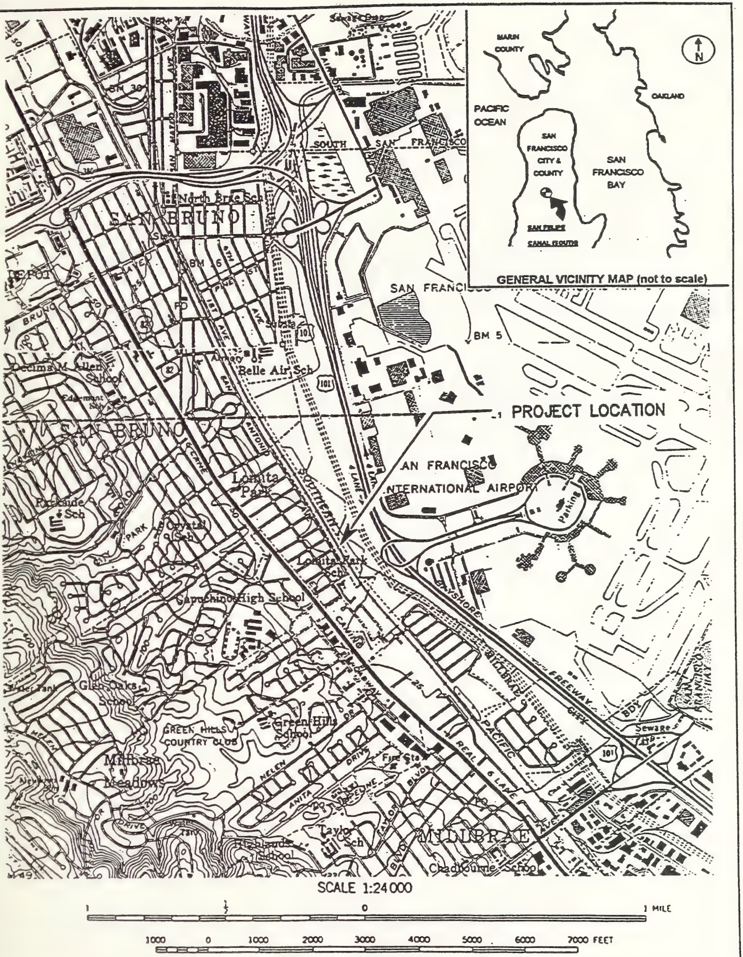
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

SECTIONS
SCALE: 1"=10'H
1"=2.5'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 57 OF 74 FEBRUARY 1996



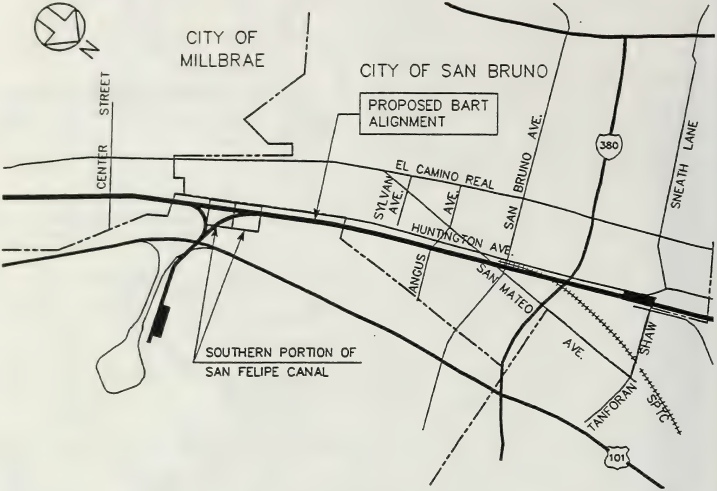
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

SAN FELIPE CANAL (SOUTH)
VICINITY MAP

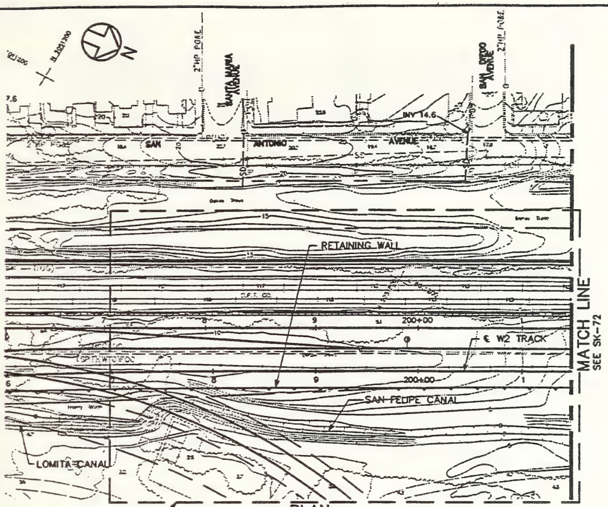
SCALE: 1"=2000'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 58 OF 74 FEBRUARY 1996



PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT DATUM: NGVD 1929 ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING	**LOCATION PLAN** SCALE: NTS BAY AREA RAPID TRANSIT DISTRICT 1000 BROADWAY, 4TH FLOOR P.O. BOX 58 OAKLAND, CA 94607	PROPOSED BART ALIGNMENT IN: AT: COUNTY OF: SAN MATEO STATE: CALIFORNIA APPLICATION BY: BART SHEET: 59 OF 74 FEBRUARY 1996

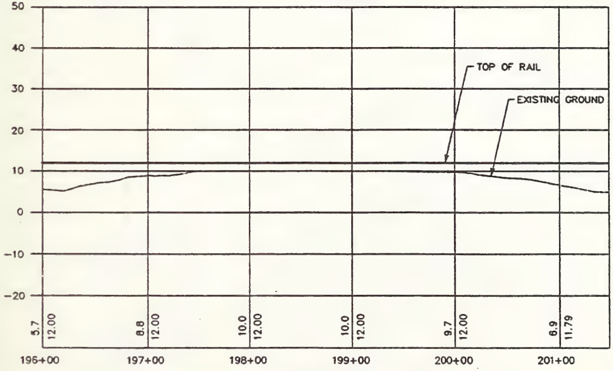


SEE SK-74 FOR ENLARGED VIEW

PLAN
SK-71

50' 0' 50' 100'

GRAPHIC SCALE



PROFILE

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

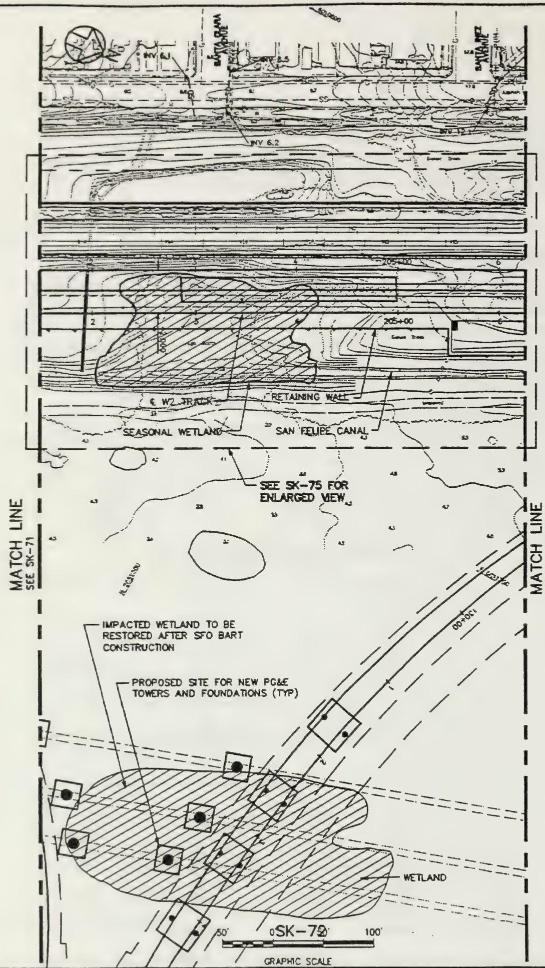
SEE ATTACHED LISTING

PLAN AND PROFILE

SCALE: 1"=100'H
1"=25'V
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 60 OF 74 FEBRUARY 1996



PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

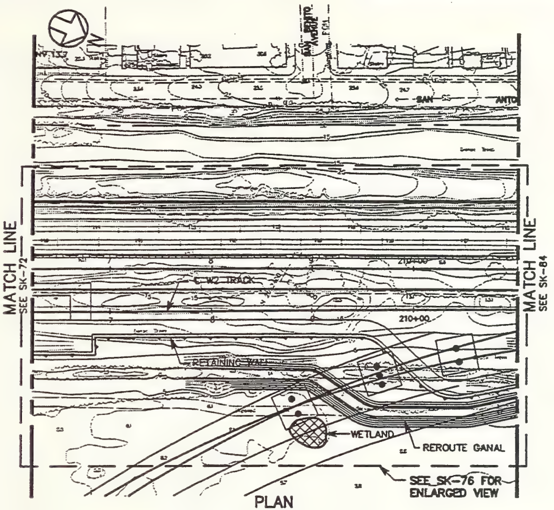
PLAN

SCALE: 1"=100'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

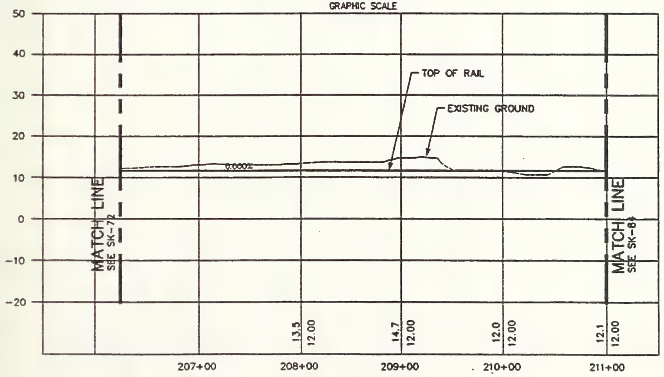
PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 61 OF 74 FEBRUARY 1996



PLAN
SK-73

50' 0' 50' 100'
GRAPHIC SCALE



PROFILE

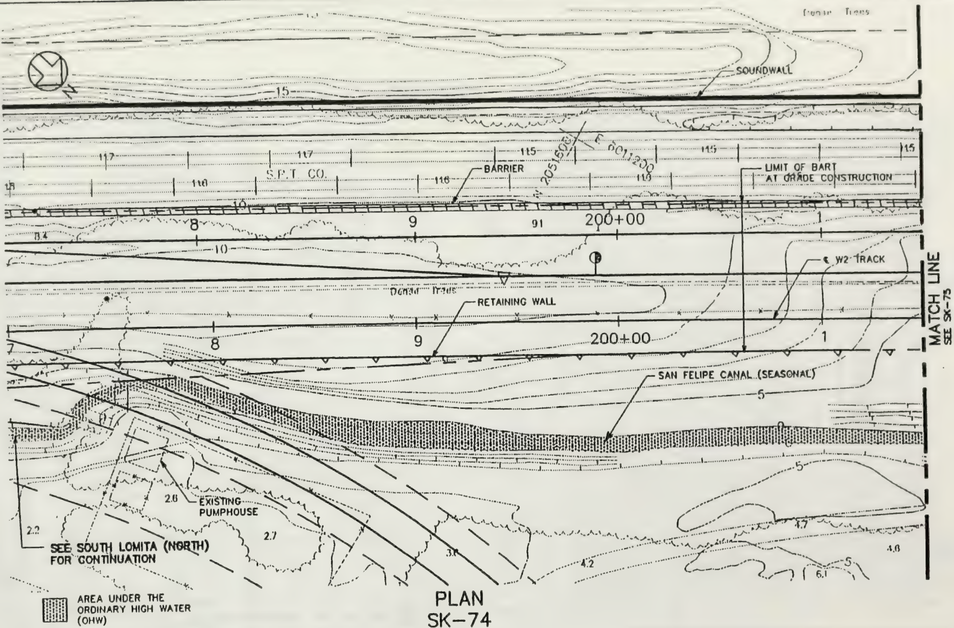
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

SEE ATTACHED LISTING

PLAN AND PROFILE
SCALE: 1"=100'H
1"=25'V
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 62 OF 74 FEBRUARY 1996



PLAN
SK–74

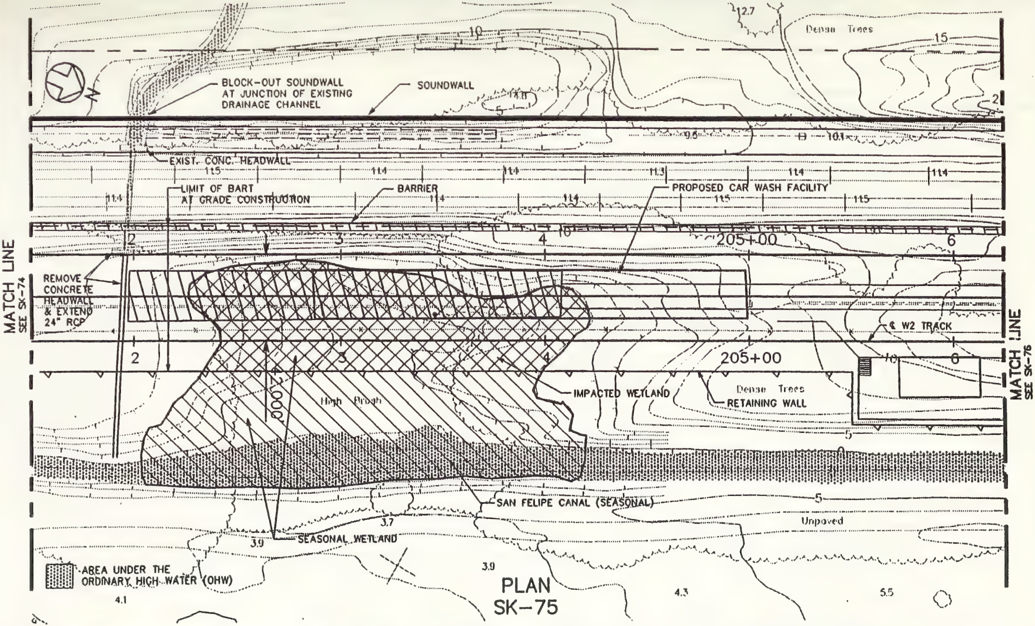
PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

ENLARGED VIEW
SCALE: 1"=50'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 63 OF 74 FEBRUARY 1996



PLAN
SK-75

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

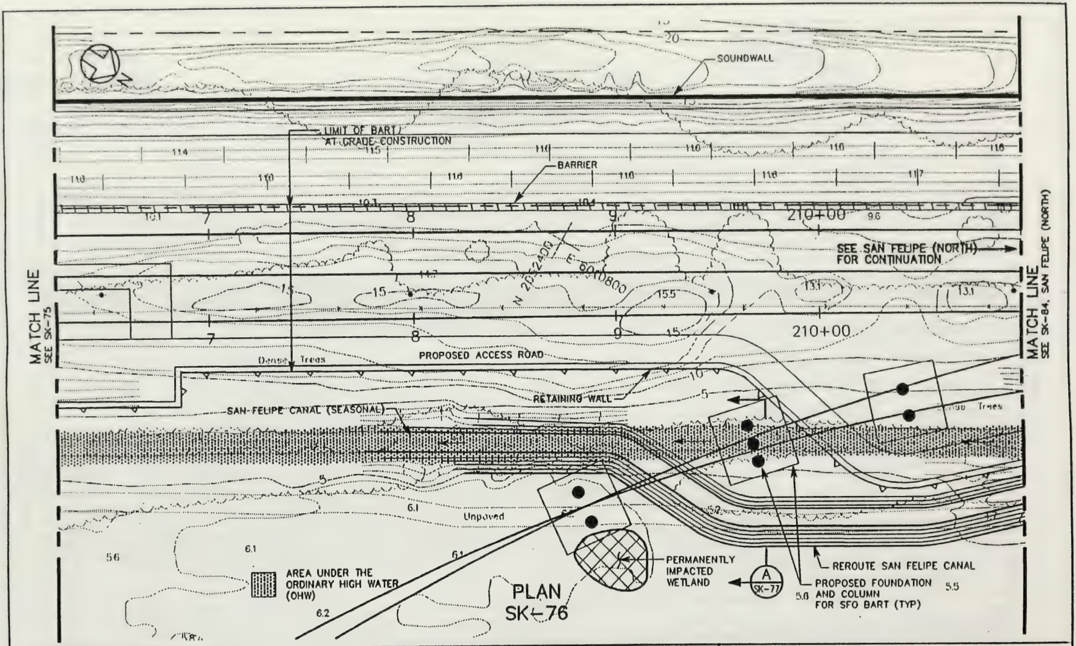
SEE ATTACHED LISTING

ENLARGED VIEW
SCALE: 1"=50'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 64 OF 74 FEBRUARY 1996


SOUNDWALL
LIMIT OF BART AT GRADE CONSTRUCTION
BARRIER
MATCH LINE
SEE SK-75
MATCH LINE
SEE SK-84, SAN FELIPE (NORTH)
SEE SAN FELIPE (NORTH) FOR CONTINUATION
N 2052400
E 6010800
210+00
210+00
7
8
9
7
8
9
PROPOSED ACCESS ROAD
Dense Trees
RETAINING WALL
SAN-FELIPE CANAL (SEASONAL)
Trees
Unpaved
AREA UNDER THE ORDINARY HIGH WATER (OHW)
PLAN
SK-76
PERMANENTLY IMPACTED WETLAND
A
SK-77
REROUTE SAN FELIPE CANAL
PROPOSED FOUNDATION AND COLUMN FOR SFO BART (TYP)

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

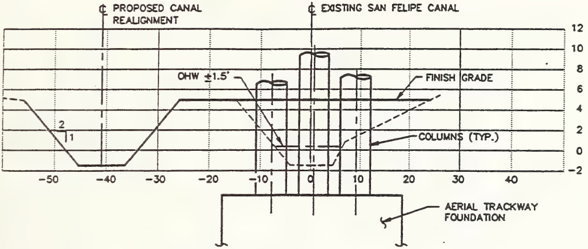
ENLARGED VIEW

SCALE: 1"=50'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 65 OF 74 FEBRUARY 1996



℄ PROPOSED CANAL REALIGNMENT
℄ EXISTING SAN FELIPE CANAL
12
10
8
6
4
2
0
-2
OHW ±1.5'
FINISH GRADE
2
1
COLUMNS (TYP.)
-50
-40
-30
-20
-10
0
10
20
30
40
AERIAL TRACKWAY FOUNDATION

SECTION (A / SK-76)

SAN FELIPE CANAL WETLAND (SOUTHERN PORTION) QUANTITIES

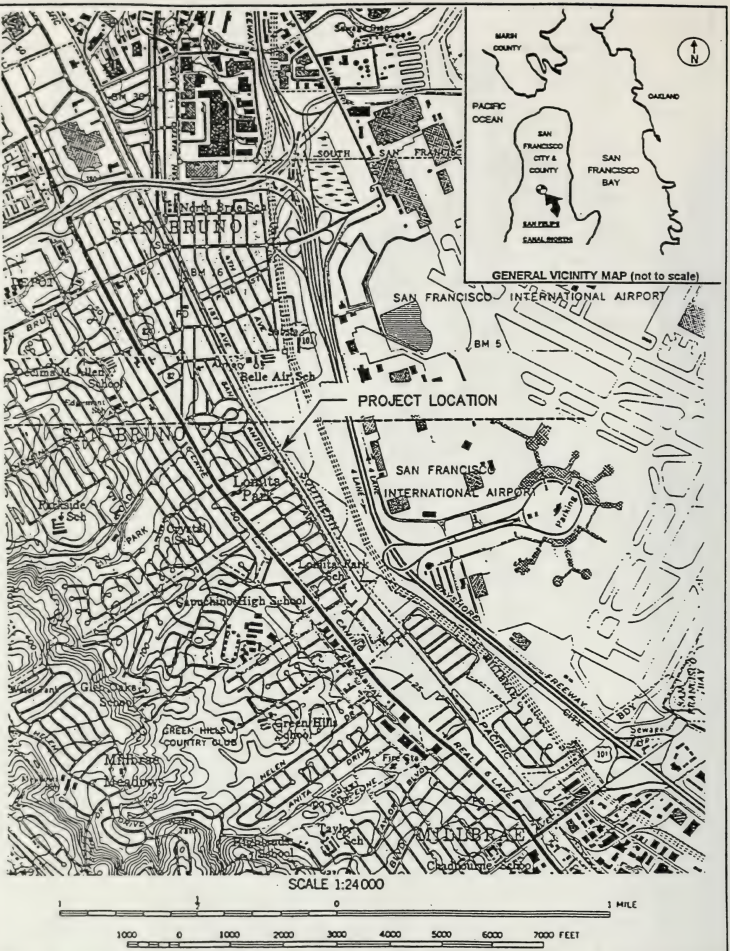
ITEM	AREA REQUIRED FOR WETLAND REPLACEMENT (AC)	FILL (CY)	EXCAVATION (CY)
PERMANENTLY IMPACTED WETLAND AREA	0.19	2,015	2,015
IMPACTED VOLUME BELOW ORDINARY HIGH WATER	N/A	116	0

SK-77

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

SECTIONS
SCALE: 1"=20'(HOR)
1"=10'(VERT)
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

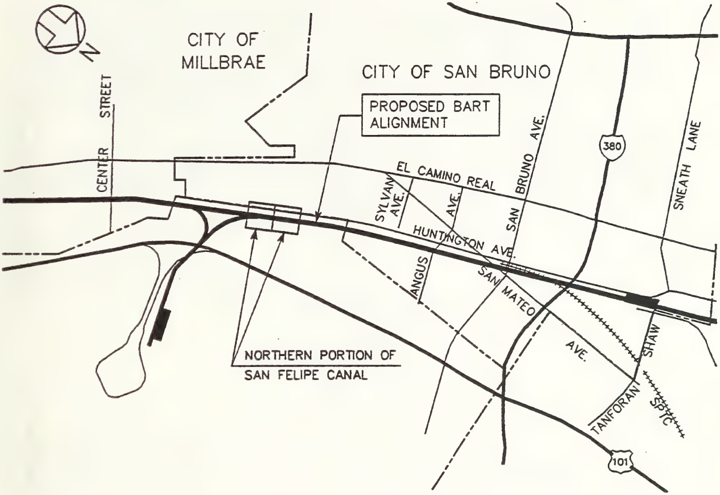
PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 66 OF 74 FEBRUARY 1996



PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

SAN FELIPE CANAL (NORTH)
VICINITY MAP
SCALE: 1"=2000'
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 67 OF 74 FEBRUARY 1996



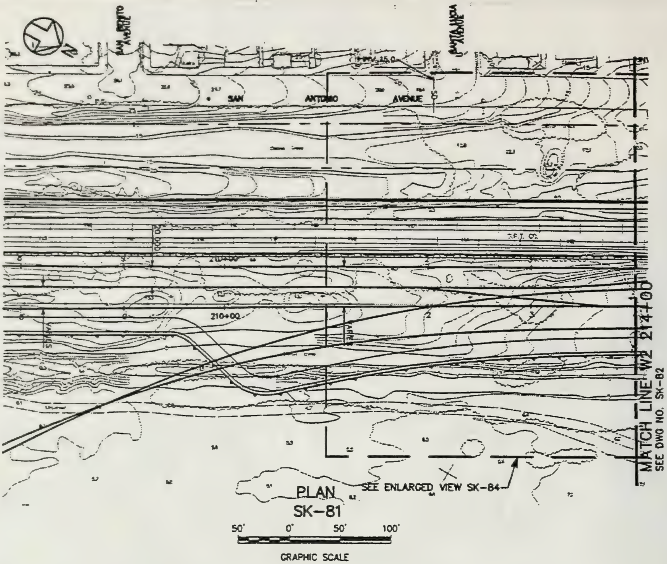
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING

LOCATION PLAN

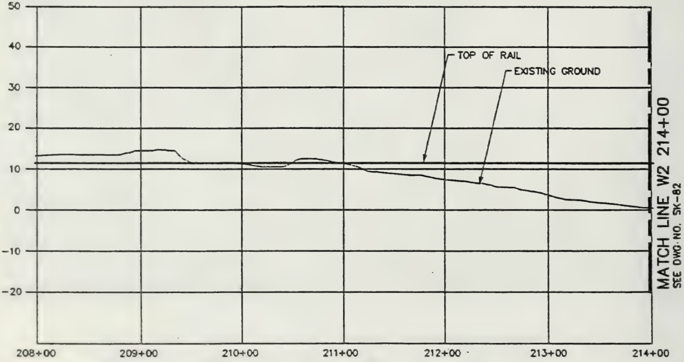
SCALE: NTS

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 68 OF 74 FEBRUARY 1996



PLAN
SK-81



PROFILE

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

SEE ATTACHED LISTING

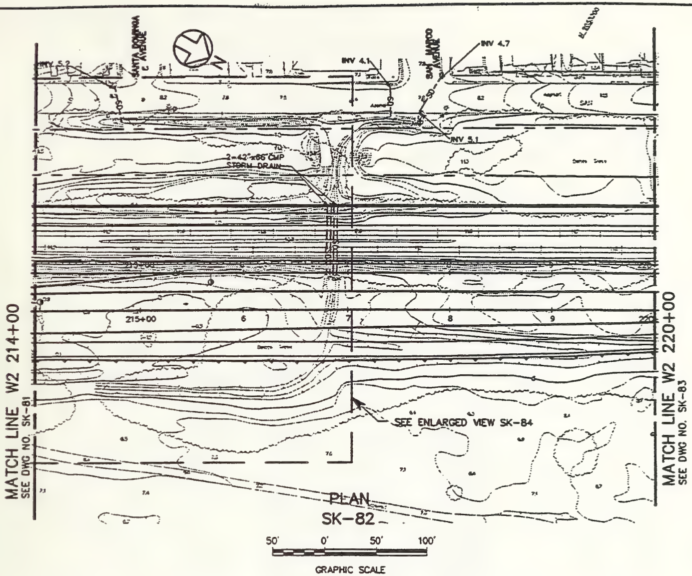
PLAN AND PROFILE

SCALE: 1"=100'H
1"=25'V

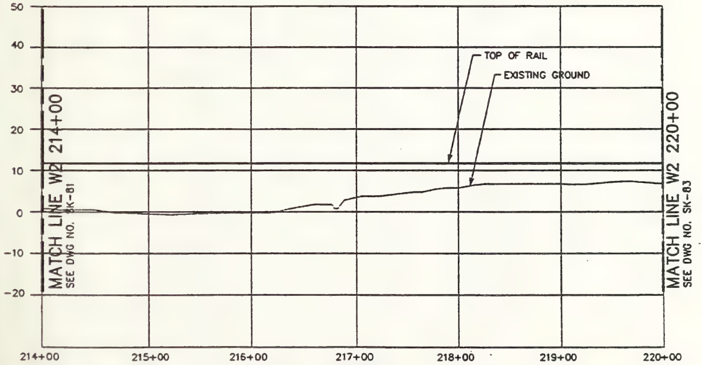
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 69 OF 74 FEBRUARY 1996

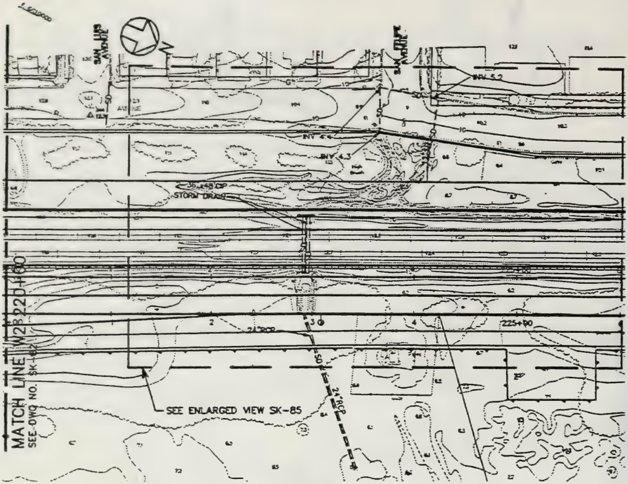


PLAN
SK-82



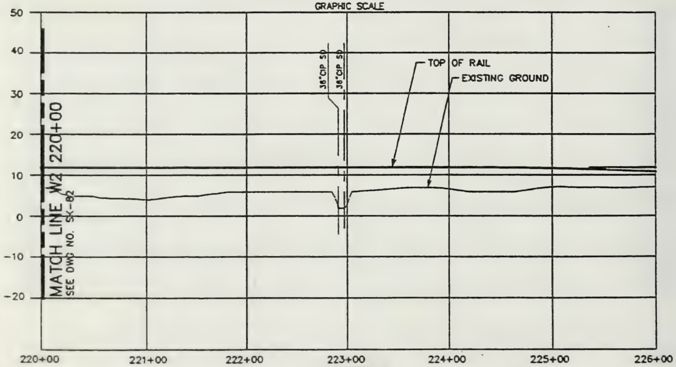
PROFILE

PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT DATUM: NGVD 1929 ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING	PLAN AND PROFILE SCALE: 1"=100'H 1"=25'V BAY AREA RAPID TRANSIT DISTRICT 1000 BROADWAY, 4TH FLOOR P.O. BOX 58 OAKLAND, CA 94607	PROPOSED BART ALIGNMENT IN: AT: COUNTY OF: SAN MATEO STATE: CALIFORNIA APPLICATION BY: BART SHEET: 70 OF 74 FEBRUARY 1995



PLAN
SK-83

50' 0' 50' 100'
GRAPHIC SCALE



PROFILE

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:

SEE ATTACHED LISTING

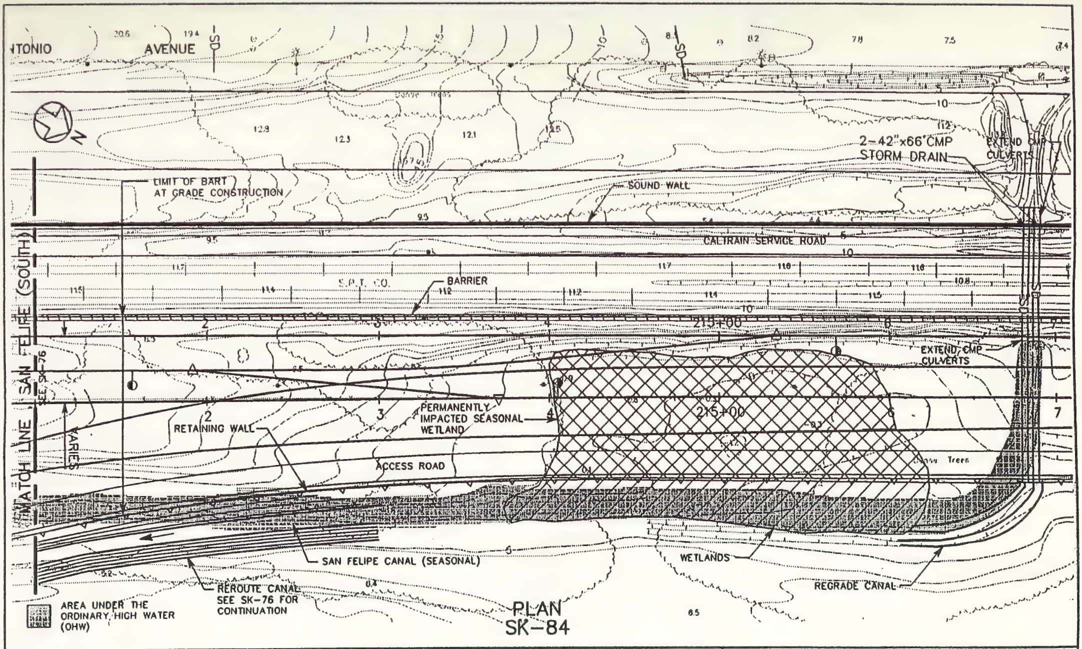
PLAN AND PROFILE

SCALE: 1"=100'H
1"=25'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 71 OF 74 FEBRUARY 1996



NTONIO AVENUE
SD
N
LIMIT OF BART AT GRADE CONSTRUCTION
SOUND WALL
2–42"x66" CMP STORM DRAIN
EXTEND CMP CULVERTS
CALTRAIN SERVICE ROAD
S.P.T. CO.
BARRIER
215+00
EXTEND CMP CULVERTS
MATCH LINE SAN FELIPE (SOUTH)
SEE SK-76
VARIES
RETAINING WALL
PERMANENTLY IMPACTED SEASONAL WETLAND
ACCESS ROAD
SAN FELIPE CANAL (SEASONAL)
WETLANDS
REGRADE CANAL
REROUTE CANAL SEE SK-76 FOR CONTINUATION
AREA UNDER THE ORDINARY HIGH WATER (OHW)
PLAN SK-84

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

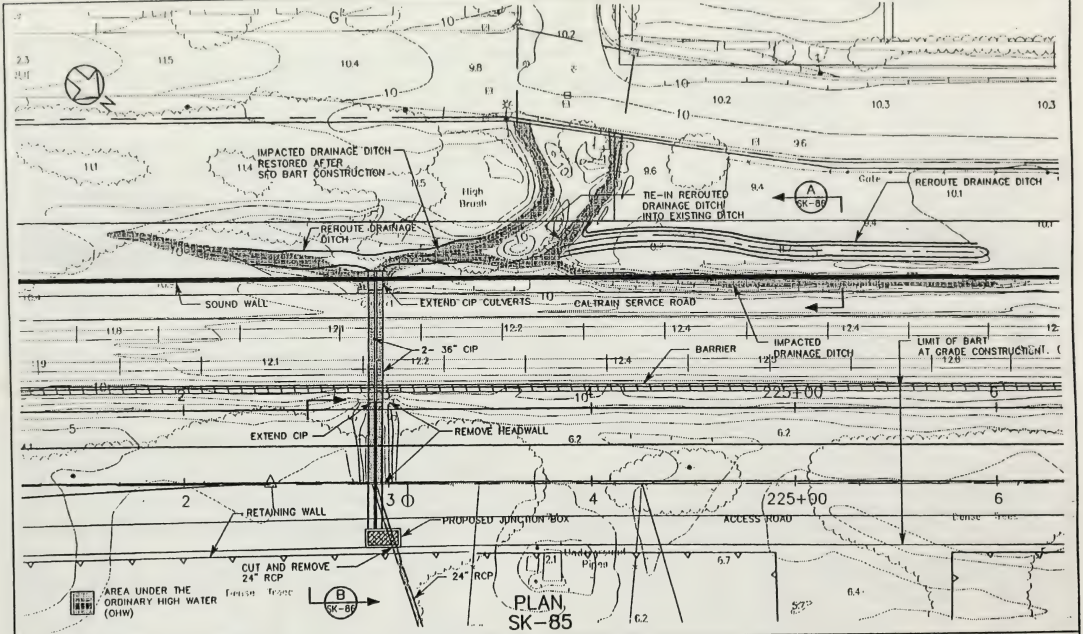
ENLARGED VIEW

SCALE: 1"=60'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 72 OF 74 FEBRUARY 1996



PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

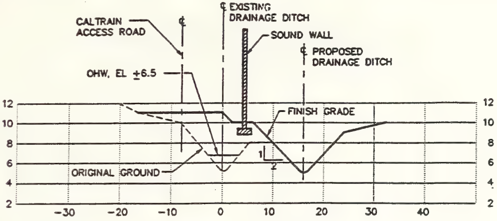
ENLARGED VIEW

SCALE: 1"=50'

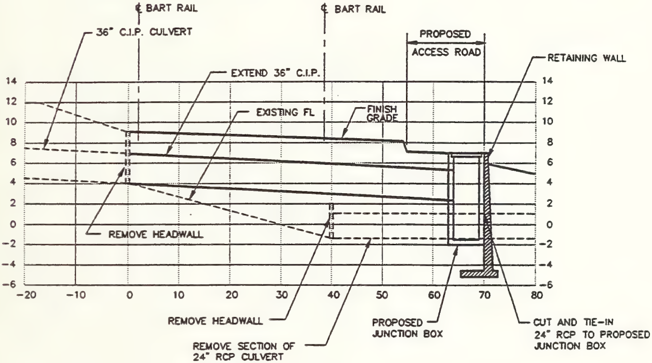
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:

COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 73 OF 74 FEBRUARY 1996



SECTION A SK−85



SECTION B SK−85

SAN FELIPE CANAL WETLAND (NORTHERN PORTION) QUANTITIES

ITEM	AREA REQUIRED FOR WETLAND REPLACEMENT (AC)	FILL (CY)	EXCAVATION (CY)
PERMANENTLY IMPACTED WETLAND AREA	0.36	N/A	N/A
PERMANENTLY IMPACTED WATERS OF THE U.S.	0.07	N/A	N/A
IMPACTED VOLUME BELOW ORDINARY HIGH WATER	N/A	128	0

SK−86

PURPOSE: PROVIDE RAPID TRANSIT
SERVICE TO SAN FRANCISCO
INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS:
SEE ATTACHED LISTING

SECTIONS
SCALE: 1"=20'(HOR)
1"=10'(VERT)
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
APPLICATION BY: BART
SHEET: 74 OF 74 FEBRUARY 1996

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
211 MAIN STREET
SAN FRANCISCO, CALIFORNIA 94105-1905

REPLY TO
ATTENTION OF:

Regulatory Branch

10 May 96

SUBJECT: File No. 19669S91

Ms. Karita Zimmerman
BART-West Bay Extensions
1000 Broadway, Suite 400 (1KB-4)
Oakland, California 94607

Dear Ms. Zimmerman:

In accordance with the Memorandum of Understanding on the NEPA and Clean Water Act Section 404 Integration process for Surface Transportation Projects in Arizona, California, and Nevada, we have made a preliminary review of the Supplemental #2 Draft Environmental Impact Statement and other supporting documents on the BART/SFO Airport Extension Project.

Based on this preliminary review we believe the preferred alternative is not likely to significantly degrade the aquatic environment, and that the proposed mitigation plan and implementation schedule appears to be adequate. Our final determination on these matters will be based on an in depth review of these documents, the outcome of the lead agency's formal consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act, and will take into consideration any new information generated from our public notice on the project.

If you have any questions, please contact Bob Smith of the Regulatory Branch at (415) 744-3324 Ext. 237.

Sincerely,

Michael J. Walsh
Lieutenant Colonel, Corps of Engineers
District Engineer

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

May 23, 1996

Ms. Karita Zimmerman
Bay Area Rapid Transit District
Environmental Compliance and Mitigation Department
P.O. Box 12688
Oakland, CA 94604-2688

Dear Ms. Zimmerman:

On May 13, 1996, EPA received your letter requesting our preliminary agreement of preferred alternative compliance with the Section 404(b)(1) Guidelines for the proposed BART extension to the San Francisco International Airport. This request is made in accordance with the National Environmental Policy Act/Section 404 Clean Water Act Integration Process Memorandum of Understanding.

It is our understanding that BART is completing the Final Environmental Impact Statement/Final Environmental Impact Report for the BART-San Francisco Airport Extension. According to the NEPA/404 MOU, BART must receive concurrence from EPA that: 1) the NEPA preferred alternative in the final EIS is the least environmentally damaging practicable alternative under Section 404; 2) the project will not significantly degrade the aquatic environment; and 3) the project mitigation plan and implementation schedule are adequate.

In recent years, we have reviewed several documents regarding the proposed project. These include the Supplemental Draft EIS (January 1995), Supplemental #2 Draft EIS (September 1995), Mitigation and Restoration Proposal (March 15, 1996), and the Army Corps of Engineers' Public Notice (March 1, 1996). We also have met on several occasions with staff of other resource agencies and BART to discuss the planning process and to inspect areas that project construction would affect.

Based on our project review, we offer preliminary concurrence that the NEPA preferred alternative is the least environmentally damaging practicable alternative under Section 404. We also believe the project will not significantly degrade the aquatic environment.

The Mitigation and Restoration Proposal of March 15, 1996, calls for establishing wetlands adjacent to Colma Creek to offset direct project impacts to slightly more than 1 acre of jurisdictional wetlands. Although it seems technically feasible to implement this proposal, the mitigation site is not well-suited for wetland creation. We believe it would be preferable to mitigate unavoidable project impacts to wetlands by creating

0.6 to 1.0 acre of wetlands west of the Caltrain tracks on the "west-of-Bayshore" parcel. Additional wetland mitigation acreage should be established at Steele Ranch or at a comparable parcel that BART has agreed to purchase in order to protect the San Francisco Garter Snake. Regardless of location, the wetland mitigation acreage should exceed the acreage of wetlands permanently affected by the project, i.e., the mitigation ratio should be greater than 1:1.

Given the uncertainty regarding the wetland mitigation plan and implementation schedule, we can offer our preliminary agreement under NEPA/404 MOU contingent on the Federal Transit Administrations inclusion of the appropriate details of the final mitigation plan along with commitments to implement those actions in the Record of Decision. We request that BART and FTA provide the final mitigation plan and implementation schedule to EPA for our review.

We appreciate the opportunity to provide these comments. We look forward to working with you and your staff towards finalizing the mitigation plan per the spirit of the NEPA/404 MOU. If you need additional information or would like to discuss these comments, please contact me at (415) 744-1584, or your staff may contact Michael Monroe of our wetlands staff at (415) 744-1963.

Sincerely,

David Farrel, Chief
Office of Federal Activities

cc: B. Hom, FTA, San Francisco
C. Fong, USACE, San Francisco
J. Medlin, USFWS, Sacramento

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Sacramento Field Office
2800 Cottage Way, Room E-1803
Sacramento, California 95825

In Reply Refer To:
PN 19669S91

May 16, 1996

Mr. Bob Hom
Director, Program Development
Federal Transit Administration, Region IV
201 Mission Street, Suite 2210
San Francisco, CA 94105

Subject: NEPA/Section 404 Integration, BART Connection to San Francisco International Airport, San Mateo County, California

Dear Mr. Hom:

This responds to your request that the U.S. Fish and Wildlife Service (Service) provide preliminary agreement on the wetlands mitigation plan for the Bay Area Rapid Transits District (BART) connection project to San Francisco International Airport. The request was made pursuant to he Memorandum of Understanding for Integration of National Environmental Policy Act and Clean Water Act Section 404 procedures for Surface Transportation Projects.

The Service recommended, in a letter to the U.S. Army Corps of Engineers, dated April 8, 1996, that creation of freshwater wetlands should take place on property that lies adjacent to the West-of-Bayshore property, between the Caltrain tracks and San Antonio Avenue, to mitigate for losses of freshwater wetlands due to project construction. Furthermore, we recommended that additional wetland creation should take place at the site that will be acquired for the San Francisco Garter Snake mitigation, as determined during the Formal Section 7 Consultation process. After receiving Richard White's, BART General Manager, May 10, 1996, letter addressing proposed mitigation, and after having conversations with Karita Zimmerman and Kathleen Pahl, BART SFO Planning Managers, we feel that our recommendations for wetland mitigation are being considered and actively pursued. Therefore, the Service agrees that BART is developing a mitigation plan that will adequately compensate for losses to freshwater wetland function and value resulting from the proposed project.

If you have any further questions regarding this project, please contact Jason Davis (Wetlands Branch) at (916) 979-2113.

Sincerely,

Joel A. Medlin
Field Supervisor

cc: AES-Portland, OR
FWS-ESD, Section 7 (K. Geer)
EPA, San Francisco (M. Monroe)
BART, Oakland (K. Zimmerman)

MITIGATION AND RESTORATION PROPOSAL FOR OFFSETTING IMPACTS ASSOCIATED WITH THE PROPOSED BART-SAN FRANCISCO INTERNATIONAL AIRPORT EXTENSION PROJECT
SAN MATEO COUNTY, CALIFORNIA

Corps File Number 19669S91

Prepared on behalf of the San Francisco Bay Area Rapid Transit District, San Francisco Airport Extension

Prepared by Vicki Reynolds
Wetland Field Biologist

March, 15, 1996

P.O. Box 901, Forestville, CA. 95436 707-887-0510

EXECUTIVE SUMMARY

This Mitigation and Restoration Proposal has been prepared on behalf of the San Francisco Bay Area Rapid Transit District ("BART") for the proposed San Francisco International Airport Extension Project. As a result of this proposed project, approximately 4.3 acres, defined as waters of the U.S. pursuant to Section 404 of the Clean Water Act, will be impacted. These waters of the U.S. include flood control channels; vegetated drainage ditches and swales; and wetlands.

Of this jurisdictional total, 3.1 acres will be replaced and/or restored in-kind. Those areas containing significant habitat, such as vegetated creeks or wetlands, will be reestablished with biologically supervised restoration. This Proposal presents a plan which will guide those restorative activities.

The remainder of the jurisdictional effects associated with this proposed project, an estimated 1.2 acres, will involve permanent impacts. Due to the variety of location and habitat functions and values of the jurisdictional impact sites, replacement ratios for permanent impacts also vary. Low-quality wetlands or waters of the U.S. have been defined for this proposed project as supporting limited wetland vegetation and/or wildlife habitat, such as Colma Creek. They are to be replaced at a ratio of 1:1. High-quality wetlands or waters of the U.S. have been defined for this proposed project as those wetlands or waters of the U.S. which are adjacent to or are known to support sensitive wildlife species, such as the San Francisco Garter Snake on the West of Bayshore Parcel. They will be replaced at a 3:1 ratio (Ogden, DEIR/SDEIS, 1995). Utilizing these ratios, total mitigation necessary to offset these permanent impacts has been calculated to be about 2.5 acres.

A proposed mitigation site has been identified, situated along the east bank of the Colma Creek Flood Control Channel ("FCC"), downstream of the proposed future South San Francisco BART Station. This proposed mitigation site will be positioned over the BART subway box, within BART's proposed alignment. Long and narrow, the site will be bisected by a permanent low flow creek, which when bank-full, will convey water up to about 1.25 feet deep. The source of the water to the creek will be the adjacent FCC.

The proposed mitigation creek will have an adjacent overbank flood zone, which during flood events could be inundated with up to 1 foot of water. Above the flood zone, a seasonally saturated zone, influenced by capillary fringe action within the soils, is expected to develop. Finally, the site will contain a transitional wetland to upland zone. With the amount of hydrological variability planned at the mitigation site, it will be possible to introduce a diversity of emergent and seasonal wetland plants within the site.

It is expected that within 5 years after implementation the proposed mitigation site will develop characteristics comparable to those of waters of the U.S.. At that time, this mitigation site will contain at least 2.7 acres of low flow creek with adjacent wetlands.

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APPENDIX D: Conceptual Grading Plans for Proposed Mitigation Site
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I. RESPONSIBLE PARTIES

A. Applicant/Permittee

The applicant for this proposed project is the San Francisco Bay Area Rapid Transit District ("BART"). The General Manager is the responsible party relative to legal and financial issues associated with this Proposal. The position of General Manager is currently held by Mr. Richard A. White, 800 Madison Street (P.O. Box 12688), Oakland, CA. 94604-2688. Telephone number is 510-287-6060. The individual responsible for assuring that this Proposal is carried out as approved by the U.S. Army Corps of Engineers ("Corps") is the Executive Manager of West Bay Extensions. This position is currently filled by Mr. P. Takis Salpeas. He can be reached at the same address as Mr. White. Mr. Salpeas' telephone number is 510-287-4815.

The contact person for BART on this proposed project is the Manager of Environmental Compliance, presently administered by Ms. Karita Zimmerman. Her street address is 1000 Broadway, Fourth Floor, Oakland, CA.; telephone number, 510-287-4866. Ms. Zimmerman's mailing address is the same as for Mr. White.

B. Preparers of This Proposal

This Mitigation and Restoration Proposal is prepared by Vicki Reynolds, Wetland Field Biologist, P.O. Box 901, Forestville, CA. 95436. Telephone number is 707-887-0510.

Much of the jurisdictional information, as well as proposed endangered species mitigation, has been generated by Mr. Ric Villasenor, Ogden Environmental and Energy Services Company, 343 Sansome Street, Suite 700, San Francisco, CA. 94104. Telephone number is 415-981-9800.

Hydrological studies at the proposed mitigation site have been conducted by Dr. Frederick A. Locher, Chief Hydraulic Engineer, Bechtel Corporation, 50 Beale Street (P.O. Box 193965), San Francisco, CA. 94119-3965. Telephone number is 415-768-7788.

The conceptual grading plans have been prepared under the direction of Mr. Donald M. Raichle, Senior Landscape Architect, Bechtel Corporation. His address is the same as Dr. Locher's. Mr. Raichle's telephone number is 415-768-4780.

Maps and Figures of the Proposed Project included in this document and Appendix A were prepared by Bay Area Transit Consultants, under the supervision of Mr. Don Scapuzzi, P.E.. His address is 1000 Broadway, 4th Floor (P.O. Box 58) Oakland, CA. 94604. Telephone number is 510-287-4702.

II. CONSTRUCTION WORK AFFECTING CORPS JURISDICTION

A. Location of Proposed Project

This Mitigation and Restoration Proposal, prepared on behalf of BART, discusses how impacts to waters of the U.S., associated with the proposed construction of a new rail extension to the San Francisco International Airport ("SFIA"), will be offset. For simplicity, this proposed project is referred to in this document as the "proposed BART-SFO extension project".

The proposed extension of BART's track proceeds from the existing Colma Station in the Town of Colma, through the City of South San Francisco, the City of San Bruno, the City of Millbrae, and to the City of Burlingame, County of San Mateo, California. Map II-1 provides a regional perspective of this overall proposed extension.

B. Brief Summary of Overall Proposed Project

The proposed extension project will leave the Colma Station, and follow the former Southern Pacific Transportation Company's San Francisco to San Jose Railroad ("SFSJRR") alignment, within a subway box. Initially it will cross through several cemetery properties paralleling El Camino Real before intersecting Mission Road.

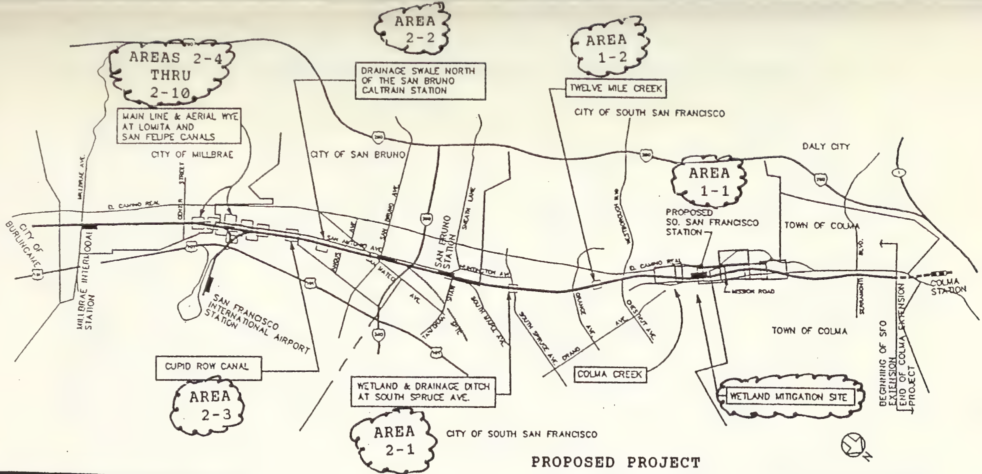
After the proposed project crosses Mission Road, it will border the east bank of Colma Creek. Generally, the creek will be upgraded from its current approximate 10-year flood capacity to one capable of handling a 50-year flood volume. The proposed BART South San Francisco Station ("SSF Station") and proposed mitigation site will be located adjacent to this particular reach of Colma Creek.

The proposed project will continue southward, still within the former SFSJRR alignment, transecting 12-Mile Creek and South Spruce Avenue. It will proceed through the new Tanforan BART Station, under Interstate Highway 380, and past the existing San Bruno Caltrain Station. From this point on, the mainline of the proposed BART-SFO extension project will parallel the existing Caltrain tracks south to the proposed BART/Caltrain Millbrae Station.

South of Cupid Row Canal, the proposed BART mainline will exit its subway box to run at grade for approximately 43,000 feet, to allow for a connection to the proposed aerial structures which will cross Highway 101 into SFIA.

For convenience, the proposed project has been separated into two parts: Segment 1 which runs from Colma Station to a point just north of South Spruce Avenue; and Segment 2 which includes that portion of the proposed project from South Spruce Avenue to the proposed Millbrae Station.

Proposed project construction is expected to commence in the latter part of 1996, following issuance of all permits, and continue through the year of 2000.



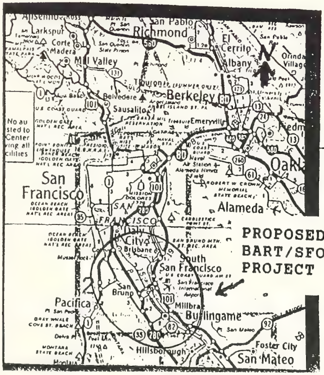
NOT TO SCALE

MAP II-1, REGIONAL LOCATION MAP AND CROSS-REFERENCE SHEET FOR MITIGATION AND RESTORATION PROPOSAL

PROPOSED BART/SFO EXTENSION PROJECT, SAN MATEO COUNTY, CALIFORNIA

Area X = Refers to various general areas along the length of the proposed project. See Section II and Table II-1.

Map Sources: From "San Francisco and Northern Peninsula", H.M. Gousha (inset); and Bay Area Transit Consultants (proposed project drawing)



Scale, 1" = ± 8 miles

C. Affected Jurisdictional Areas

1. Summary of Impacts

The proposed project stretches over about 12 miles. As such, the areas of jurisdiction are not consolidated within one specific portion of the proposed project, but rather are scattered as small pockets throughout the proposed project.

The proposed BART-SFO extension project will be affecting, with both temporary and permanent impacts, waters of the U.S. as defined pursuant to Section 404 of the Clean Water Act ("CWA").

The total acreage of jurisdictional areas effected by the proposed project, including both temporary and permanent impacts, is about 4.3 acres. Of these, about 3.1 acres will be temporarily impacted, implying that they will be restored following completion of the proposed project.

Permanent impacts to jurisdictional areas associated with this proposed project will be approximately 1.2 acres.

2. Characteristics of the Jurisdictional Impact Areas

There are 27 jurisdictional areas which will be directly impacted, either temporarily or permanently, by the proposed BART-SFO extension project. These jurisdictional areas include flood control channels, either concrete-lined or earthen; vegetated drainage ditches and swales; and seasonal wetlands.

This section describes the existing conditions of these sites and provides the areal extent of jurisdictional fill within each. Table II-1 summarizes each of the jurisdictional impact sites and also segregates the types of impacts, defining those areas requiring habitat restoration (temporary impacts) or habitat compensation (permanent impacts).

Appendix A contains a select number of plan drawings from BART's Section 404 application to the Corps indicating those jurisdictional areas which will be filled or altered by the proposed project. Each impact site is individually numbered and referenced in Table II-1, Appendix A plan drawings, and the ensuing sections, to facilitate understanding the impacts of the proposed project. Map II-1 also cross-references locations of the general areas mentioned in this section.

The reader should refer to the "Wetlands Delineation Report" (Ogden, DEIR/SDEIS, 1995), for more specific information concerning any of the jurisdictional areas.

Segment 1, affected jurisdictional sites:

a. Area 1-1, vicinity of Colma Creek:

1. Site 1-1a, Colma Creek upstream and downstream of the proposed BART SSF Station: This reach of Colma Creek currently consists of a concrete-lined flood control channel ("FCC") with a flood capacity of approximately a 10-year storm. Flows within the creek are year-round. Summer flows are presumed to be generated by over-irrigation of upstream

TABLE II-1
SUMMARY OF JURISDICTIONAL IMPACTS
PROPOSED BART/SFO EXTENSION PROJECT
Corps File Number 19669S91

Site Designation, Drawing # in Appendix A, Site Number/Description	Habitat Type at Impact Site	Acreage, Permanent Impact	Proposed Mitigation Ratio	Acreage, Temporary Impact[1]
"Segment 1 Impacts":				
Vicinity of proposed SSF Station (drawings 1 - 6):				
#1-1a, Colma Creek upstream and downstream of proposed SSF Station	Concrete lined channel			1.9 acres
#1-1b, Colma Creek under proposed SSF Station	Concrete lined channel	0.46 acre	1:1	
#1-1c, Swale in the vicinity of proposed Station parking facility	Ephemeral freshwater drainage swale with willow & berries	0.03 acre	1:1	
Vicinity of 12-Mile Creek (drawing 7):				
#1-2, reach of 12-Mile Creek under proposed BART subway	Concrete lined channel			0.02 acre
"Segment 2 Impacts":				
Vicinity of South Spruce Avenue (drawing 8):				
#2-1a, Drainage ditch paralleling northern side of So.Spruce Avenue	Partially concrete /earth ephemeral drainage ditch, with freshwater plants			0.05 acre
#2-1b, Seasonal wetland north of drainage ditch #2-1a	Freshwater willow thicket			0.25 acre
Vicinity of Caltrain's San Bruno Station (drawing 9):				
#2-2, Drainage ditch north of station[2]	Ephemeral freshwater drainage swale	0.01 acre	1:1	0.01 acre

Site Designation, Drawing # in Appendix A, Site Number/Description	Habitat Type at Impact Site	Acreage, Permanent Impact	Proposed Mitigation Ratio	Acreage, Temporary Impact[1]
Vicinity of Cupid Row Canal (drawings 10 and 11):				
#2-3a, Western portion of canal, for approximately 300 l.f. downstream (east) of Huntington Avenue	Perennial freshwater canal, with emergents			0.06 acre
#2-3b, Northern tributary to Cupid Row Canal	Ephemeral freshwater drainage swale	0.01 acre	3:1	0.05 acre
#2-3c, Seasonal wetland pond adjacent to Highway 101	Seasonal wetland pond with willow thicket			0.09 acre
#2-3d, Two isolated seasonal wetlands, south of Cupid Row Canal	Seasonal wetland			0.04 acre
Vicinity of San Felipe Avenue, unnamed drainage system (drawing 12):				
#2-4a, Northeastern branch of drainage system, west of Caltrain tracks	Ephemeral freshwater drainage swale			0.02 acre
#2-4b, Southerly branch of drainage system, west of Caltrain tracks	Ephemeral freshwater drainage swale			0.02 acre
#2-4c, Main drainage under Caltrain tracks, reaches east and west of tracks	Ephemeral freshwater drainage swale	0.02 acre	3:1	

Site Designation, Drawing # in Appendix A, Site Number/Description	Habitat Type at Impact Site	Acreage, Permanent Impact	Proposed Mitigation Ratio	Acreage, Temporary Impact[1]
Vicinity of northern reach of San Felipe Canal (drawing 13):				
#2-5a, Main drainage west of Caltrain tracks	Ephemeral freshwater drainage swale	0.002 acre	1:1	
#2-5b, Main drainage east of Caltrain tracks	Ephemeral freshwater drainage swale	0.05 acre	3:1	
#2-5c, Depressional wetland east side of Caltrain tracks, south of site 2-5b	Seasonal freshwater pond, with emergents	0.36 acre	3:1	
San Felipe Canal, vicinity of proposed northern aerial wye intersection (drawing 14):				
#2-6a, San Felipe Canal	Ephemeral freshwater drainage canal			0.16 acre
#2-6b, Seasonal wetland	Seasonal freshwater wetland			0.02 acre
Vicinity of San Felipe Canal, between proposed aerial wyes (drawing 15):				
#2-7a, Depressional wetland	Seasonal freshwater pond, with emergents	0.17 acre	3:1	
#2-7b, Drainage ditch, south of site 2-7a	Ephemeral freshwater drainage canal	0.01 acre	3:1	
Depressional wetland, adjacent to Highway 101 (drawing 16):				
#2-8, Depressional wetland	Seasonal freshwater pond, with emergents			0.33 acre
Proposed PG&E Towers within wetland		0.01 acre	3:1	
Proposed BART columns within wetland		0.003 acre	3:1	

Site Designation, Drawing # in Appendix A, Site Number/Description	Habitat Type at Impact Site	Acreage, Permanent Impact	Proposed Mitigation Ratio	Acreage, Temporary Impact[1]
Extreme southern reach of San Felipe Canal (drawing 17)				
#2-9, San Felipe Canal	Ephemeral freshwater drainage canal			0.03 acre
Vicinity of southern reach of South Lomita Canal (drawings 18 & 19):				
#2-10a, Main tributary ditch to South Lomita Canal, west of Caltrain tracks	Concrete lined ditch			0.05 acre
#2-10b, Main tributary ditch to South Lomita Canal, east of Caltrain tracks	Permanently flooded freshwater canal with emergent vegetation & willows	0.02 acre	3:1	
#2-10c, Depressional wetland, west of Caltrain tracks and north of #2-10a	Seasonal freshwater wetland	0.02 acre	1:1	
#2-10d, Drainage ditch, south of main tributary to South Lomita Canal, east of Caltrain	Ephemeral freshwater drainage swale			0.03 acre
TOTALS		1.2 ACRE		3.1 ACRES

1. The category of temporary impact refers to those sites which will involve 1 for 1 restoration, in place; or contiguous replacement of like habitat, function, and value. See Sections II. and IV. for complete information.

2. Some impact sites include acreages listed under both permanent and temporary impacts. In those cases, partial restoration coupled with mitigation replacement, to fully offset specific impacts, is indicated.

landscaping. Winter flows are flashy, as this creek collects run-off from a steeply sloping watershed of about 10.8 square miles, measuring from a former stream gauge downstream of the proposed BART SSF Station (Locher, 1996).

Being concrete-lined, little vegetative growth occurs within the creek bed itself, aside from algae and a few plants which have been able to root within cracks in the concrete. An occasional willow atop the creek bank leans over the creek channel, providing very limited habitat.

Total existing jurisdictional area, below ordinary high water ("OHW") associated with Colma Creek within the proposed project reach, from near the intersection of Mission Street and El Camino Real in Colma to Oak Street in South San Francisco, is approximately 2.34 acres. Temporary impacts, associated with the upgrading of Colma Creek into a FCC with capacity of approximately 50-year storms, will be about 1.9 acres.

2. **Site 1-1b**, box culvert under the proposed BART SSF Station: For approximately 1250 linear feet, Colma Creek will be placed within a box culvert as it is passed under the proposed BART SSF Station site. The area of permanent impact, to be mitigated at the proposed mitigation site with a 1:1 ratio, is approximately 0.46 acre.

3. **Site 1-1c**, wetland swale through proposed BART SSF Station parking facility: This wetland swale currently consists of an unmaintained open drainage, overgrown with *Salix lasiolepis* (arroyo willow), FACW (Reed, 1988)[1]; and *Rubus discolor* (Himalaya blackberry), FAC. This swale conducts flows, originating at a 42-inch culvert exiting from under El Camino Real, into Colma Creek. The proposed parking facility will involve permanently filling this entire swale, requiring habitat replacement of about 0.03 acre. This replacement will occur, at a 1:1 ratio, within the proposed mitigation site.

Photos 1 and 2 illustrate the general existing conditions of Colma Creek in this reach as well as the relationship between the creek and swale 1-1c.

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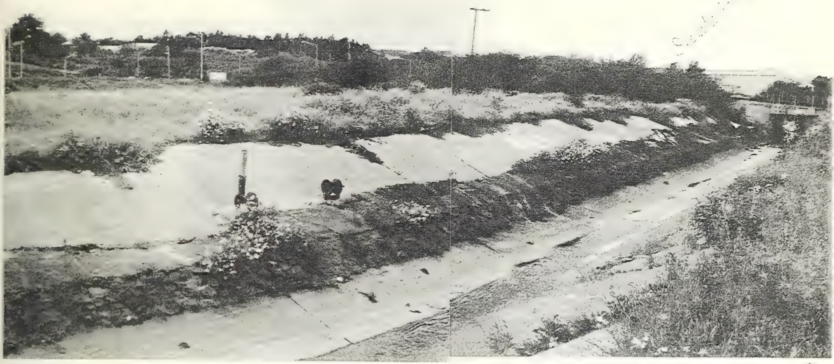
[1] Plant indicator categories according to National List of Plant Species that Occur in Wetlands: California (Region 0), by Porter B. Reed, Jr., USFWS. OBL = Obligate Wetland plants: Occur almost always (estimated probability >99%) under natural conditions in wetlands. FACW = Facultative Wetland plants: Usually occur in wetlands (estimated probability 67%-99%). FAC = Facultative plants: Equally likely to occur in wetlands or nonwetlands (estimated probability 34%-66%). FACU = Facultative Upland plants: Usually occur in nonwetlands, but occasionally found in wetlands (estimated probability 1%-33%). UPL = Obligate Upland plants: Occur almost always (estimated probability >99%) under natural conditions in nonwetlands. NI = Not indicated on the list for this region.



2.

Photos 1 and 2, above: Sites 1-1b and 1-1c, looking northwesterly at existing Colma Creek. This is a portion of creek which will be under the proposed BART South San Francisco Station. Site 1-1c is in the background. April 17, 1995.

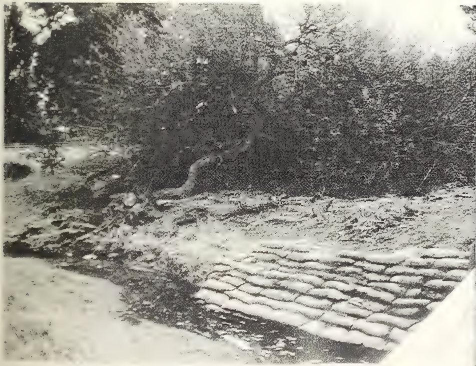
PROPOSED BART-SFO EXTENSION PROJECT, CORPS FILE NO. 19669S91
Photos by Vicki Reynolds, Wetland Field Biologist

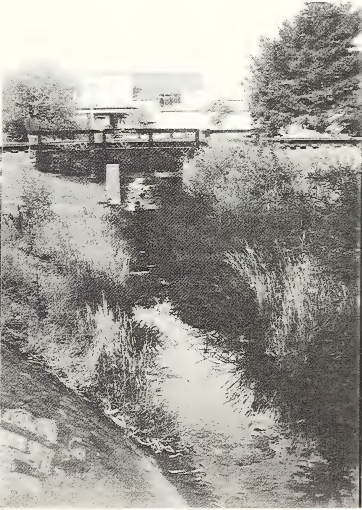
Photos 3 and 4, Site 2-3a.
Photo 3, below: Section of Cupid Row Canal west of existing Caltrain tracks.

Photo 4, right: Section of Cupid Row Canal east of existing Caltrain tracks. August 7, 1995.

4.

3.





b. **Area 1-2, Twelve-mile Creek:** This creek is another concrete-lined channel, with no adjacent wetlands. The creek would be temporarily disturbed during construction of the proposed BART subway. This creek will be restored as a concrete-lined channel, of similar dimensions, following BART construction. Temporary, non-habitat impacts associated with Twelve-mile Creek, are 0.02 acre.

Segment 2, affected jurisdictional sites:

a. **Area 2-1, wetland and drainage swale north of South Spruce Avenue:** This area consists of a drainage swale and a small wetland which will be disturbed during proposed subway construction, which is to involve a cut and cover technique. Both sites are to be restored following construction.

1. **Site 2-1a, drainage swale:** The subject swale is located between two culverts which parallel South Spruce Avenue. Consisting of a channel with a concrete bottom and vertical right bank, the left bank is earthen. This earthen bank is vegetated with

Salix lasiolepis
Rubus discolor
Lolium sp. (ryegrass), FAC
Cyperus eragrostis (umbrella sedge), FACW
Baccharis pilularis (coyote brush), UPL

Temporary impacts to this swale equal about 0.05 acre.

2. **Site 2-1b,** seasonal wetland: Adjacent to and northward of site 2-1a, is a small isolated seasonal wetland. It is separated from the swale by a low berm. This wetland developed within a depressional feature, between two embankments associated with the former SFSJRR railroad alignment. It is currently vegetated with

Salix lasiolepis
Rubus discolor
Lolium sp.
Picris echioides (bristly ox-tongue), FAC
Rumex crispus (curly dock), FACW
Holcus lanatus (velvet grass), FAC
Plantago coronopus (plantain), FAC

The proposed project will temporarily displace this entire area, involving an estimated 0.25 acre of seasonal wetland.

b. **Area 2-2, drainage swale north of Caltrain San Bruno Station:** This drainage swale is ephemeral in nature, conducting flows between Huntington Avenue and the Caltrain tracks. It is vegetated with wetland grasses common to disturbed areas, primarily *Holcus lanatus*. The overstory to the swale consists of ornamentals including

Callistemon spp. (bottlebrush), UPL
Acacia spp. (acacia tree), UPL
Pinus radiata (Monterey pine), UPL

Temporary impacts, caused by proposed subway construction, will amount to approximately 0.01 acre. Permanent impacts will be comparable, about 0.01 acre, to be mitigated with a 1:1 ratio at the proposed mitigation site.

The following jurisdictional impact areas all occur adjacent to or on the West of Bayshore Parcel, property owned by SFIA.

c. **Area 2-3, vicinity of Cupid Row Canal:** This area involves several sites which will be impacted by the proposed project, as individually discussed below.

1. **Site 2-3a**, western section of Cupid Row Canal, for approximately 300 linear feet downstream (easterly) of Huntington Avenue: This section of Cupid Row Canal is to be abandoned and replaced by a similar channel extending approximately 75 feet to the north, in order to resolve a conflict between the final top elevation of the proposed BART subway and the invert elevation of the existing canal. This replacement will occur following construction of this specific portion of the proposed subway box. Temporary impacts to Cupid Row Canal will be an estimated 0.06 acre.

The existing Cupid Row Canal is a channel improved for flood control, with fairly steep banks. The channel passes through two box culverts, one under the Caltrain tracks and the second under a concrete bridge supporting an access road to the West of Bayshore Parcel.

The channel is dirt-lined upstream and downstream of the box culverts. Water permanently flows through this reach, although summer levels are low, less than a foot deep. This canal connects to San Francisco Bay about 9000 feet (1.7 mile) downstream.

Various wetland plants grow along the canal banks and shallow bottom, such as

Cyperus eragrostis (umbrella sedge), FACW
Rorippa nasturtium-aquaticum (water cress), OBL
Salix lasiolepis, both mature and immature trees
Scirpus americanus (American bulrush), OBL

Photos 3 and 4 represent current conditions along this canal.

2. **Site 2-3b**, small tributary drainage swale north of Cupid Row Canal: This is a shallow, narrow dirt-lined ditch which parallels the east side of the Caltrain tracks, providing drainage to a linear area between the tracks and the access road to Lion Field and West of Bayshore Parcel. The ditch bottom supports a seasonal wetland plant community comprised of

Eleocharis spp. (spikerush), most FACW or wetter
Alisma plantago-aquatica (broad-leaf water plantain), OBL
Xanthium strumarium (ordinary cocklebur), FAC
Cyperus eragrostis

Cynodon dactylon (Bermuda grass), FAC
Rumex crispus
Salix lasiolepis
Vitis californica (CA. grape), FACW, growing on willows

Permanent impacts to the southern portion of this ditch will be caused by the proposed realignment of Cupid Row Canal. They will be about 0.01 acre, to be replaced at the proposed mitigation site at a ratio of 3:1. Temporary impacts from proposed subway construction will consist of approximately 0.05 acre.

3. **Site 2-3c, seasonal wetland pond northwest of Cupid Row Canal and Highway 101:** This site involves a small portion of a seasonal wetland pond which will be impacted by a proposed access road from Highway 101 to the proposed contractor's laydown site on the West of Bayshore Parcel. It includes a temporary crossing over the northeastern branch of Cupid Row Canal, via a pre-constructed trestle bridge (a nonjurisdictional activity pursuant to Section 404).

In addition to a willow thicket, dominated by *Salix lasiolepis*, this wetland contains a seasonal wetland plant community composed of

Raphanus sativus (wild radish), UPL
Juncus mexicanus (rush), FACW
Picris echioides (bristly ox-tongue), FAC
Xanthium strumarium
Atriplex patula (fat hen), FACW
Lolium sp.
Lactuca serriola (prickly lettuce), FAC

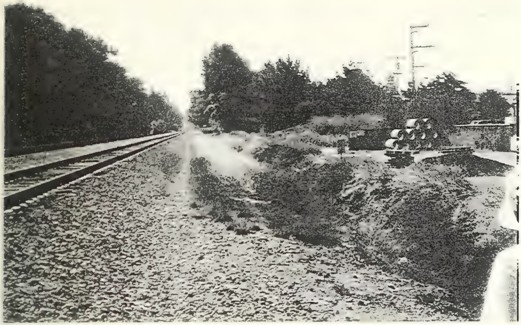
Adventitious roots of willows and distribution of algal mats on the wetland vegetation suggest that this wetland complex may seasonally pond surface water to 2 feet in depth.

This wetland pond will be restored following removal of the access road. Temporary impacts to this site will approximate 0.09 acre.

4. **Site 2-3d, two isolated seasonal wetlands, south of Cupid Row Canal:** This site involves two shallow seasonal wetlands which will be temporarily impacted by a proposed contractor's laydown yard. Several inches of surface water pond in these wetlands during the rainy season, evaporating with the onset of spring. Plants found inhabiting these two sites include

Lotus corniculatus (bird's-foot trefoil), FAC
Lolium perenne (perennial ryegrass), FAC
Rumex crispus
Hordeum murinum ssp. leporinum (Hordeum leporinum) (no common name), NI
Atriplex patula
Plantago coronopus

As these wetlands are to be restored following conclusion of



5.

Photo 5, left: Site 2-4a Looking south at drainage ditch paralleling west side of Caltrain tracks.

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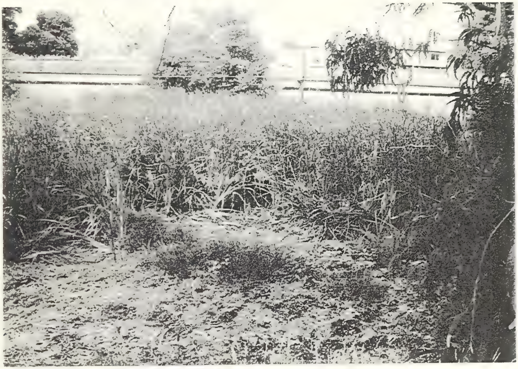
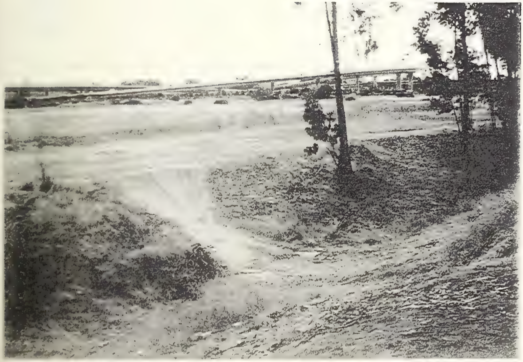
Photo 6, right: Site 2-5c. Looking west at seasonal wetland adjacent to northern San Felipe Canal. Caltrain tracks in background.

6.





7.

Photo 7, left: Portion of Site 2-6a, San Felipe Canal.

Photos on this page taken on August 7, 1995 by
Vicki Reynolds
Wetland Field Biologist

construction, temporary impacts will account for about 0.04 acre.

d. **Area 2-4, unnamed drainage, east of San Felipe Avenue:** This area involves an ephemeral freshwater ditch system consisting of several branches which function to collect local seasonal surface runoff, originating in part from two storm drain outlets under Huntington Avenue. Flows are directed eastward under the Caltrain tracks where the remaining single ditch terminates at a storm drain inlet connected to the West of Bayshore Parcel's storm water system. Maintenance of the ditch system appears to be regular, allowing for revegetation mostly by ruderal grasses and blackberries. Impacts vary from temporary to permanent as a result of the proposed construction activities, as discussed below.

1. **Site 2-4a**, northeastern branch of drainage system, west of Caltrain tracks: This particular reach of ditch currently flows along the eastern boundary of an open storage yard. This existing alignment will be impacted by the proposed sound wall associated with the proposed at-grade tracks. Following wall construction, a ditch of similar dimensions will be reconstructed, resulting in temporary impacts of about 0.02 acre. Photo 5 illustrates a typical portion of the ditch.
2. **Site 2-4b**, southern branch of drainage system, west of Caltrain tracks: A portion of this specific ditch is to be rerouted westward to accommodate the proposed sound wall, as well. Following soundwall construction, this ditch will be replaced with a comparable ditch. Temporary impacts are an estimated 0.02 acre.
3. **Site 2-4c**, main drainage under Caltrain tracks, reaches east and west of the tracks: These portions of the main drainage will be impacted so as to allow for the extension of the existing dual 36-inch culverts to the west and east of the proposed BART facilities, which include the sound wall and at-grade tracks. Permanent impacts, to be compensated for at the proposed mitigation site at a 3:1 ratio, approximate 0.02 acre.

e. **Area 2-5, vicinity of the northern portion of San Felipe Canal:** This area consists of the upper reaches of a drainage known as San Felipe Canal, together with an adjacent wetland. Each site, with specific construction impacts, is described below.

1. **Site 2-5a**, the most northwesterly portion of San Felipe Canal, west of the Caltrain tracks: This portion of the canal is essentially a narrow vegetated drainage ditch. It conducts storm flows from three storm drains exiting along the east edge of San Antonio Avenue. Flows through this portion of the ditch seem to be restricted to the rainy months of the year. The area is very disturbed in appearance and vegetation consists of ruderal grasses, such as *Lolium sp.*.

Permanent impacts to a small portion of this reach of the canal will be associated with the proposed extension of the existing twin box culvert storm drain westward to accommodate the proposed sound wall through this stretch. These impacts, an estimated 0.002 acre, will be replaced at the proposed mitigation site at a 1:1 ratio.

2. **Site 2-5b**, main drainage of San Felipe Canal, east of Caltrain tracks: This portion of San Felipe Canal consists of a wide, marginally vegetated channel crossing from the east side of the Caltrain tracks through a mature eucalyptus grove. Permanent impacts to this site will be caused by the extension of the east side of the existing twin box culvert storm drain to allow for the proposed at-grade tracks, car wash access road, and retaining wall. They will approximate 0.05 acre. Mitigation for these impacts will occur at the proposed mitigation site at a ratio of 3:1.

3. **Site 2-5c**, depressional wetland pond south of site 2-5b: The drainage described above flows into a small wetland which has developed within a depression at the base of the east side of the Caltrain track embankment. This wetland, still within the eucalyptus grove, is dominated by *Typha latifolia* (broad leaved cattail), OBL. Other plant species within the wetland include

Xanthium strumarium
Alisma plantago-aquatica
Eleocharis sp.
Cyperus eragrostis
Raphanus sativus
Algal mats

This wetland was observed ponding water up to about 3 feet deep in the Spring of 1994. Photo 6 illustrates this site.

Permanent impacts to this wetland will involve about 0.36 acre. They will result from construction of the proposed at-grade tracks, access road, and retaining wall, affecting the western portion of the wetland pond. The eastern portion of the wetland pond will become a part of San Felipe Canal, as shown on Drawing 13 of Appendix A. Mitigation for the permanent impacts is to occur at the proposed mitigation site at a ratio of 3:1.

f. **Area 2-6, vicinity of San Felipe Canal at the proposed northern aerial wye intersection:** This area involves a portion of San Felipe Canal and adjacent seasonal wetland, both of which are just south of area 2-5, previously discussed. This area is impacted by the proposed at-grade mainline tracks, car wash access road, and retaining wall as well as several pier footings and columns to support the proposed northern wye stub into SFIA. Each of these jurisdictional impact sites is discussed below.

1. **Site 2-6a**, a second portion of San Felipe Canal, south of site 2-5c: This site will also be temporarily impacted by the proposed construction, affecting about 0.16 acre. Following construction, a realigned San Felipe Canal, with similar dimensions and area, will be reconstructed to the east of

its current alignment.

As with site 2-5b, this portion of the canal is still under the eucalyptus grove, and hence is only lightly vegetated, along the bottom and up to about ordinary high water. Plants include

Xanthium strumarium
Alisma plantago-aquatica
Cyperus eragrostis

Eucalyptus debris is plentiful across the bottom of the canal. Photo 7 represents current dry season conditions within this general part of the canal.

2. **Site 2-6b**, shallow seasonal freshwater wetland, east of site 2-6a: This site, situated adjacent to one of the onsite dirt access roads, consists of a highly disturbed area with deep tire ruts and large spaces of barren ground. Soil compaction within the tire ruts has created conditions to cause water to pool, very shallowly. Hence, this site supports a marginal seasonal wetland plant community. Vegetation found within the tire ruts consists of

Juncus bufonius (toad rush), FACW
Plantago lanceolata (common plantain), FAC
Vulpia bromoides (no common name), FACW
Juncus mexicanus
Lilaea scilloides (flowering quillwort), OBL
Plantago coronopus
Rumex crispus
Psilocarphus brevissimus (woolly heads), OBL

This site will be temporarily displaced by construction associated with one of the proposed aerial wye support columns. Temporary impacts are estimated at approximately 0.02 acre.

g. **Area 2-7, vicinity of San Felipe Canal, between the two proposed aerial wye stubs:** This is an area to be permanently impacted by the proposed at-grade mainline tracks, the proposed car wash, a third track leading into the proposed car wash, and retaining wall. The two impacted sites are discussed separately in the following description.

1. **Site 2-7a**, seasonal freshwater pond which developed in a depression immediately east of the Caltrain embankment: This site consists of a seasonal freshwater pond, with water depths to 3 feet during the rainy season. Surface ponding can be found to several inches into the middle of summer in the deepest portion of the pond. The dominant vegetation in the pond is *Typha latifolia*. Other noted vegetation include

Xanthium strumarium
Cyperus eragrostis
Rubus discolor, limited to several small areas
Dipsacus sp. (teasel), UPL
Algae

This wetland is also partially under the canopy of eucalyptus trees.

The proposed impacts to the western portion of the pond are an estimated 0.17 acre, to be replaced at the proposed mitigation site with a 3:1 ratio. Photo 8 represents current conditions at this site.

2. **Site 2-7b**, drainage ditch south of wetland site 2-7a, conveying flows into San Felipe Canal from west of the Caltrain tracks: This existing ditch involves a narrow, shallow seasonal ditch vegetated with ruderal grasses. Impacts are approximately 0.01 acre, to be mitigated at the proposed mitigation site at a ratio of 3:1.

h. **Area 2-8, seasonal freshwater wetland pond adjacent to Highway 101, northwesterly of southbound off-ramp from Highway 101 into SFIA:** This area consists of a man-made depressional wetland whose water levels are controlled by the invert elevation of an outlet culvert situated at the southern end. Ponding can be expected to 3 - 4 feet during the latter portion of the rainy season, and standing water in the deepest parts can persist into the middle of summer.

Plants within this wetland pond are stratified in accordance to their affinity to inundation or saturation, with at least four distinct plant communities being evident. The deepest portions of the pond are dominated by *Typha latifolia*. The next shallower zone, also subject to seasonal inundation, contains

Atriplex patula
Polygonum hydropiper (marshpepper), OBL
Eleocharis macrostachya (creeping spikerush), OBL
Rumex crispus
Juncus mexicanus
Algae

The third shallower zone, within 3 - 4 feet above the pond bottom, is subject to the least inundation. Vegetation found within this zone include

Lythrum hyssopifolium, (no common name), FACW
Holcus lanatus
Polygonum hydropiper
Eleocharis macrostachya
Rumex crispus
Agrostis stolonifera (creeping bent grass), FACW

The fourth and final zone, hydrologically tied to the wetland pond, is within the seasonal saturation zone. Plants occurring in this zone include

Bromus mollis (soft chess), FACU
Holcus lanatus
Rumex acetosella (sheep sorrel), FAC
Avena fatua (wild oats), UPL
Lolium sp.
Raphanus sativus

This area is to be impacted both by the proposed

8.

Photo 8, left: Site 2-7a, seasonal wetland pond adjacent to San Felipe Canal. Looking southwest, with Caltrain tracks in background.

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Photos on this page taken on August 7, 1995 by Vicki Reynolds, Wetland Field Biologist

Photos 9 and 10, below: Area 2-8, looking northeasterly. Note alignment of PG&E towers relative to this wetland pond. South-bound off-ramp from Highway 101 into the San Francisco International Airport is in the background.

9.

10.

construction of the northern aerial wye stub as well as the proposed raising of Pacific Gas and Electric's ("PG&E's") San Mateo-Martin 115kV tower lines to allow for construction of the aerial wye stubs. These two activities will involve temporary impacts of approximately 0.33 acre, primarily due to access and pier construction impacts. Restoration of the wetland will occur following the conclusion of all construction activities in this area.

Photos 9 and 10 represent the current condition of this wetland pond.

Each activity, which also includes small permanent impacts, is discussed individually.

1. **Proposed PG&E tower raising:** This particular activity is necessary to allow safe passage of the BART trains under the existing power lines. Five to six new tubular steel towers will be erected adjacent to BART's aerial support columns, of which five tower footings will be entirely or partially within the subject wetland. PG&E proposes to utilize a temporary earthen berm, between 50 - 75 feet in width, to facilitate this construction. Upon completion of footing construction and tower erection, the footings will be buried and the earthen berm will be removed and the impacted areas restored. Four of the steel towers will be situated within this wetland, resulting in above ground permanent impacts of about 0.01 acre. These impacts will be offset at the proposed mitigation site at a ratio of 3:1.

2. **Proposed northern aerial wye stub:** The proposed alignment of the northern aerial wye stub places four support columns, with footings, within the subject wetland. Each footing will support two columns. BART proposes to construct in this area from a wooden trestle, eliminating the use of fill for the construction access. Following construction of the footings, the footings will be buried, leaving only the four support columns above the wetland surface. The permanent impacts caused by the columns will approximate 0.003 acre, to be mitigated at the mitigation site at the rate of 3:1.

i. **Area 2-9, extreme southern end of San Felipe Canal:** This area consists of the extreme southern portion of San Felipe Canal, just north of the confluence point between this canal and South Lomita Canal. This portion of San Felipe Canal is also under a canopy of eucalyptus trees. Similar to the rest of San Felipe Canal, this particular site is very lightly vegetated, primarily along the ditch bottom up to ordinary high water. Vegetation is comparable to that found within site 2-6a.

The proposed southern aerial wye stub will temporarily impact this area for construction of a column footing across San Felipe Canal. Following construction, the footing will be buried, and the channel recreated to flow over the footing, between the two associated support columns. Temporary impacts are approximately 0.03 acre.

j. **Area 2-10, vicinity of southern reach of South Lomita Canal:** This area involves construction activities associated with the placement of the proposed tracks into a subway box at the southwestern end of the West of Bayshore Parcel. Each of the jurisdictional impact sites is discussed separately due to the varying characteristics affecting replacement ratios.

1. **Site 2-10a**, main tributary ditch to South Lomita Canal, west of the Caltrain tracks: This ditch provides the main drainage to a residential area west of the impact area. The ditch through this reach is concrete-lined, and unvegetated. About 55 feet of the existing ditch will be realigned northward to avoid conflict with the proposed track transition into a subway box, resulting in about 0.05 acre of temporary impacts. The realigned ditch will be similarly concrete-lined.

2. **Site 2-10b**, main tributary ditch to South Lomita Canal, east of the Caltrain tracks: This portion of the main tributary into South Lomita Canal will be realigned to conform with the proposed reconfiguration of site 2-10a, as previously discussed. The majority of this proposed reconfiguration will involve placement of the tributary flows into a box culvert under Caltrain and the proposed tracks. The existing portion of the main tributary ditch east of Caltrain will be filled to accommodate the construction of the proposed tracks through this section. Permanent impacts associated with this construction are an estimated 0.02 acre. These permanent impacts will be compensated for at the proposed mitigation site at a ratio of 3:1.

Unlike site 2-10a, the tributary on the east side of the tracks is dirt-lined, and permanently flooded to several feet above the bottom. Photos 11 and 12 illustrate current conditions along this tributary.

The tributary is quite overgrown by blackberries and willows. Plants found growing within the channel bottom and lower banks include

Typha latifolia
Alisma plantago-aquatica
Cotula coronopifolia
Conium maculatum (poison hemlock), FACW
Equisetum sp. (horsetail), FAC
Scirpus acutus (hard-stem bulrush), OBL
Lemna sp.

3. **Site 2-10c**, seasonal depressional wetland west of the Caltrain tracks and north of site 2-10a: This site consists of the south portion of a linear freshwater wetland which has developed between the west side of the Caltrain embankment and an earthen berm behind a row of houses. A portion of the wetland will be permanently displaced by the proposed realignment of ditch 2-10a. Impacts will approximate 0.02 acre, to be offset at the proposed mitigation site on a 1:1 basis.

The elevation of this wetland is higher than ditch 2-10a,

11.

12

Photos 11 and 12, above: Site 2-10a, tributary ditch to South Lomita Canal.
Photo 11, above left, views this ditch in an easterly direction, with the southbound off-ramp into the San Francisco International Airport from Highway 101 in the background.
Photo 12, above right, looks at the ditch toward the west. Caltrain track can be seen through the trees. Both photos taken August 7, 1995.

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Photos taken by Vicki Reynolds, Wetland Field Biologist

Photos 13 and 14, below: Site 2-10c, looking northerly along the west side of the Caltrain track at the southern portion of this seasonal wetland. Photos taken January 4, 1996.

13.

14.

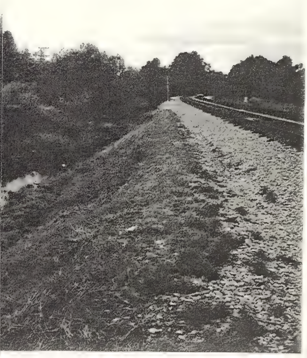

TABLE II-2, SUMMARY OF FUNCTIONS AND VALUES

	GENERAL CATEGORIES OF FUNCTIONS AND VALUES							
Site/ Area	Water Transport	Flood Reduction	Aquatic Habitat	Urban Bird Habitat	Wildlife Shelter	Wildlife Food Source	Wetland Habitat	Endangered Species Habitat
1-1a	Y							
1-1b	Y							
1-1c	M	M		Y	Y	Y, S	Y	
1-2	Y							
2-1a	Y			M			M	
2-1b		Y	M, S	Y	Y	Y	Y	
2-2	Y							
2-3a	Y		Y	Y	Y	Y	Y	M
2-3b	Y		M, S	M		M	M	
2-3c		Y	Y, S	Y	Y	Y	Y	Y
2-3d			M, S			M	M	M
2-4a	Y						M	
2-4b	Y						M	
2-4c	Y						M	
2-5a	Y						M	
2-5b	Y						M	
2-5c		Y	Y, S	Y	Y	Y	Y	Y
2-6a	Y		M, S	M			M	M
2-6b			M, S			M	M	M
2-7a		Y	Y, S	Y	Y	Y	Y	Y
2-7b	Y							
2-8		Y	Y, S	Y	Y	Y	Y	Y
2-9	Y		M, S	M			M	M
2-10a	Y							
2-10b	Y		Y	Y	Y	Y	Y	Y
2-10c		M	M, S	M	M	M	M	
2-10d	M			Y	Y	Y, S	M	M

See Section II.C.3., page II-13, for explanation of letters used in this table.

with the wetland bottom elevation about equal to the top of that ditch bank. Water accumulates in this wetland during the rainy season primarily due to local surface run-off along the west side of the Caltrain tracks. During extreme storm events, it might function marginally as a flood basin to ditch 2-10a. This wetland is hydrologically connected to ditch 2-10a at its south end by a pipe, approximately 6 inches in diameter. However, this pipe is poorly maintained and overgrown, and apparently inadequate to drain this linear wetland, allowing for standing water to collect in this wetland during the rainy season.

Vegetation in this wetland is sparse and consists of
Digitaria sp. (crabgrass) FAC to FACU
Rubus discolor
Typha latifolia

Photos 13 and 14 represent this portion of the wetland.

4. **Site 2-10d**, drainage ditch south of main tributary to South Lomita Canal, east of Caltrain: This site involves an ephemeral freshwater drainage ditch which is to be relocated eastward to allow for the construction of the proposed at-grade tracks transition into the subway box. Temporary impacts will involve an approximate 0.03 acre.

This dirt-lined ditch currently is relatively shallow, and heavily overgrown with *Rubus discolor*. Occasional *Equisetum sp.* are also evident.

3. Functions and Values of Jurisdictional Impact Areas

There are 27 jurisdictional areas which will be impacted, either permanently or temporarily, by the proposed BART-SFO extension project. There is a great deal of variability in functions and values as well as location between the numerous jurisdictional impact areas. Table II-1 organized each of the sites in accordance to location and habitat type. Table II-2 summarizes the functions and values of these jurisdictional impact sites.

In Table II-2, each site was measured relative to eight different functions or values, including water transport, flood reduction or attenuation, aquatic habitat, urban bird habitat, wildlife shelter, wildlife food source, wetland habitat, and endangered species habitat. A site which exhibits a particular function or value, is assigned a "Y" under that function or value. If a particular function or value is known to be restricted to only part of the year, an "S" was added to modify the presence of that function or value. A third letter, "M", was added to indicate a situation whereby a site may exhibit a particular function or value, but only in a very limited way, signifying something less than implied by the letter "Y".

The following narrative briefly elaborates on Table II-2 for the jurisdictional impact areas, discussing some of the primary functions and values of each particular site. Those sites whose primary function is water transport, as listed in Table II-2, will not be discussed in this section, since most are concrete lined channels or marginally vegetated drainage ditches, providing marginal or no other important function or value.

a. **Site 1-1c, swale in the vicinity of the proposed SSF Station parking facility:** This site consists of a narrow and shallow dirt-lined drainage swale, with ephemeral flows originating at and west of El Camino Real. Poorly maintained, it is overgrown predominately with willows and blackberries. In its current state, it provides local bird habitat, wildlife shelter, and a seasonal food source when the berries are ripe.

b. **Site 2-1b, seasonal wetland north of drainage ditch 2-1a and South Spruce Avenue:** This area consists of a depressional wetland which is fed by local surface run-off. Containing a willow thicket with seasonal ponding characteristics, this area functions in local flood attenuation and provides some limited seasonal aquatic habitat. Isolated from other similar habitats, this site would be important to any residual local wildlife population, including birds, as a source of food and shelter.

c. **Site 2-3a, western portion of Cupid Row Canal:** This site includes the westerly portion of Cupid Row Canal. Although concrete lined through two box culverts, the majority of the channel is dirt-lined, permitting wetland vegetation and willows to become established periodically between flood control maintenance activities. Flows in this creek are permanent and can vary from brackish to freshwater. This site historically provided aquatic habitat utilized by the California red-legged frog ["red-legged frog"] (*Rana aurora draytonii*) and the San Francisco garter snake ["SFGS"] (*Thamnophis sirtalis tetrataenia)*[2] (Wharton, 1988; and McGinnis and Larson, 1991; in Ogden B.A., 1996). This use has not been recently reevaluated, and therefore the function of providing endangered species habitat would be considered as marginal.

d. **Site 2-3c, seasonal wetland pond adjacent to Highway 101:** This area is a seasonal wetland pond which has developed within a depression. As such, it likely collects local surface run-off, slowing flood flows into the adjacent Cupid Row Canal. Willows dominate this wetland, providing food and shelter to the local wildlife population. The seasonal ponding is expected to develop periodic aquatic habitat, and as such potentially provides habitat for the SFGS.

e. **Site 2-3d, two isolated seasonal wetlands south of Cupid Row Canal:** This area consists of two small isolated wetlands which have developed within the grasslands of the West of Bayshore Parcel. The functions and values of these two areas are considered marginal, due to the flashy nature of the hydrology of these wetlands, and their small size. Shallow surface ponding can be expected to persist through the rainy season, providing aquatic habitat to small invertebrates, which in turn can be a food source to wildlife.

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[2] Both of these species are considered sensitive by the USFWS and CDFG. The red-legged frog is a federal candidate for listing as endangered under the Federal Endangered Species Act ("FESA") and is a California "Species of Special Concern". The SFGS is listed as endangered pursuant to the FESA and California Endangered Species Act.

f. **Site 2-5c, depressional wetland in northern portion of San Felipe Canal:** This site involves a seasonal wetland pond which formed within a depression adjacent to San Felipe Canal. Vegetated predominately with cattails, this wetland is likely to function in flood reduction for the downstream canal. The density of the cattails provides good cover to birds and wildlife.

Water to this wetland comes primarily from several upstream storm drains, along the west side of the Caltrain tracks. Water quality, as observed during January 1996, in this wetland is poor, with a faint odor of petroleum. Nevertheless, this site is utilized by the SFGS in the spring as a corridor to other parts of the site (Wharton, 1988; and McGinnis and Larson, 1991; in Ogden B.A., 1996).

g. **Site 2-6b, seasonal wetland east of San Felipe Canal:** This area is another seasonal wetland which has developed within the grassland portion of the West of Bayshore Parcel, adjacent to one of the onsite dirt roads. Formed primarily within tire ruts, it would be expected to exhibit similar functions and values as site 2-3d.

h. **Site 2-7a, depressional wetland adjacent to San Felipe Canal, between proposed aerial wye stubs:** This is a second depressional wetland which has developed adjacent to San Felipe Canal. It displays similar functions and values, as well as water quality, as site 2-5c.

i. **Area 2-8, seasonal wetland pond adjacent to Highway 101:** This area is the second, most southerly, seasonal wetland pond adjacent to Highway 101. Dominated by cattails and herbaceous wetland plants, this site very likely functions in local flood attenuation. Providing seasonal aquatic habitat, this is another site utilized for feeding by SFGS as well as the local wildlife (Wharton, 1988; and McGinnis and Larson, 1991; in Ogden B.A., 1996).

j. **Site 2-10b, eastern portion of main tributary to South Lomita Canal:** This is part of the main tributary to South Lomita Canal, east of the Caltrain tracks. Although part of a drainage system, with fairly vertical slopes, the channel is unlined, thus enabling a wetland plant community to develop along its banks and bottom. An associated plant community of willows and blackberries provides canopy to the creek, while also producing impenetrable thickets, important in the function of wildlife shelter. This particular area can provide year-round habitat for the SFGS. It gains its importance not only from the vegetative cover, but also from the year-round permanence of the water source and adjacency to South Lomita Canal, an area with the largest number of documented SFGS on the West of Bayshore Parcel (Wharton, 1988; and McGinnis and Larson, 1991; in Ogden B.A., 1996).

k. **Site 2-10c, depressional wetland west of Caltrain tracks:** This site involves a fairly marginal seasonal wetland situated between a row of houses to the west, and the Caltrain embankment to the east. Predominately vegetated by crabgrass, only isolated pockets of cattails are evident. This area likely performs limited flood attenuation to the channel immediately to the south, site 2-10a, while also providing limited seasonal aquatic habitat during the rainy season when the site accumulates water.

l. **Site 2-10d, drainage ditch south of eastern portion of main tributary to South Lomita Canal:** This site consists of an ephemeral drainage swale overgrown by blackberries. As such, it contributes shelter and a seasonal food source to the local wildlife. Because of its proximity to 2-10b and dense berry thicket, it has the potential of being utilized by the SFGS.

III. PROPOSED MITIGATION SITE

A. Location and Size of Mitigation Area

The proposed mitigation site is located downstream of the proposed BART SSF Station, positioned over the proposed BART subway alignment. A linear site, it extends for approximately 2070 linear feet. The width of the proposed mitigation site varies from 80 to 90 feet, due to the configuration of the land which BART will be purchasing for their proposed alignment in this reach. Total area involved in this site is about 4.0 acres.

Map II-1 shows this site relative to the proposed BART-SFO extension project. Photos 15 - 17 represent current conditions.

Appendix C discusses alternative sites considered as potential mitigation sites and factors contributing to the final site selection.

B. Ownership Status

The proposed mitigation site, a portion of the former SFSJRR alignment, is currently owned by the San Francisco City and County Water Department ("Water Department"). BART will purchase the property as part of the proposed BART-SFO extension project and will continue to own and manage this proposed mitigation site, in accordance with this Proposal.

C. Jurisdictional Areas

The proposed mitigation site does not contain any areas considered jurisdictional pursuant to Section 404 of the CWA.

D. Existing Characteristics, Functions, and Values of Mitigation Area

Being part of a former railroad alignment, the majority of the proposed mitigation site currently consists of the abandoned railroad embankment composed of imported rock and fill. This portion is generally unvegetated, except for a few tenacious weeds.

Depressions along either side of the former track embankment tend to become, at a minimum, saturated during the rainy season. These depressions support mostly ruderal wetland and transitional plants, including

Salix lasiolepis, in random thickets consisting of several intertwined trees
Lolium sp.
Plantago lanceolata
Rubus discolor

The remainder of the proposed mitigation site can be classified as upland. These upland areas support a variety of weedy herbs and grasses such as

Avena sp.
Raphanus sativus
Brassica sp. (wild mustards), UPL
Eschscholzia californica (California poppy), UPL

Due to the limited quality of the plant communities within the proposed mitigation site, existing functions and values are not expected to be highly important. The random willow thickets can be assumed to provide nesting and roosting habitat to urban birds. These same thickets would provide shelter to small resident rodents or mammals, such as mice or raccoons. Other small animals potentially in this area would include gophers, moles, rats, lizards, dogs, and cats. Seeds from the various herbs and grasses, as well as the plants themselves, likely provide some food source to the local wildlife, as well.

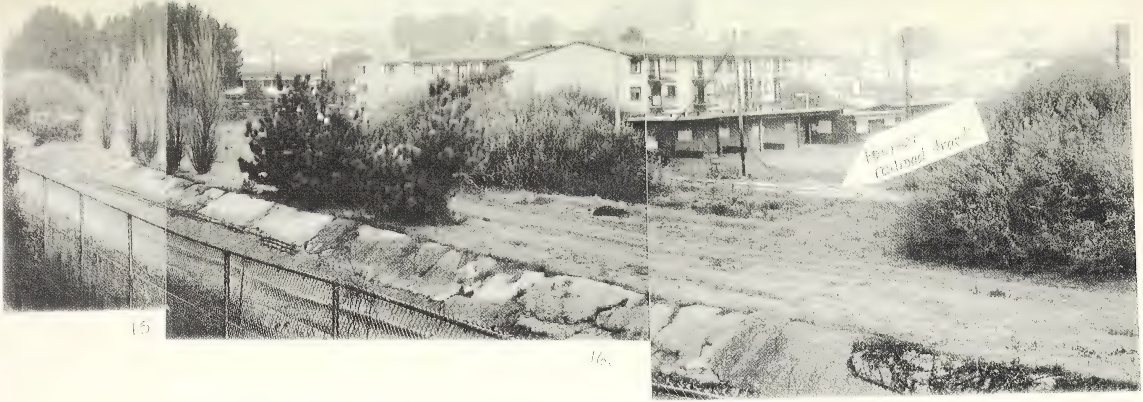
E. Historic, Present, and Future Uses of Mitigation Area

As previously mentioned, the proposed mitigation site consists of a portion of the former SFSJRR alignment. This area currently is owned by the Water Department, with little active land management being evident. During the year preceding preparation of this report, there were no noticeable attempts at weed control or tree removal in this specific area.

The proposed mitigation site is traversed, in a generally perpendicular direction from southwest to northeast, by several utility crossings, as shown on Figures III-1 and III-2. The first of these crossings, toward the southern end, at approximately Station 17+06, consists of an overhead crossing of a local PG&E power line. None of the wooden support poles are situated within the proposed mitigation site, and therefore this specific crossing is not likely to require entry into the site by PG&E for maintenance purposes. Nevertheless, BART will contact PG&E to work out a maintenance procedure for this line should any future needs arise.

The second crossing, at about Station 17+44, consists of a 12-inch water line, identified as CWSC#8, which, following proposed subway construction, will be relocated onto the top of the subway box, such as not to conflict with the proposed mitigation design. Since this pipe may require future maintenance, BART will also reach an agreement with this utility prior to mitigation implementation to guide such work.

The third and fourth utility crossings through the site involve two parallel sewer lines situated at approximately Stations 27+31 and 27+41, belonging to the City of South San Francisco. Following mitigation implementation, these crossings will be 5 to 6 feet below the proposed mitigation channel bottom elevation, and are not likely to be a hinderance to mitigation creation and/or success. As with all of the other utilities, prior to proposed mitigation implementation, BART will make an agreement with the City to direct future maintenance activities.



Photos 15 through 17, above: Looking easterly at a portion of the proposed mitigation site, vicinity of Station 17+00. Note the random clumps of willows along the former railroad track. Existing Colma Creek, part of Site 1-1a, is in the left foreground.

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Photos taken by Vicki Reynolds, Wetland Field Biologist on February 9, 1996.

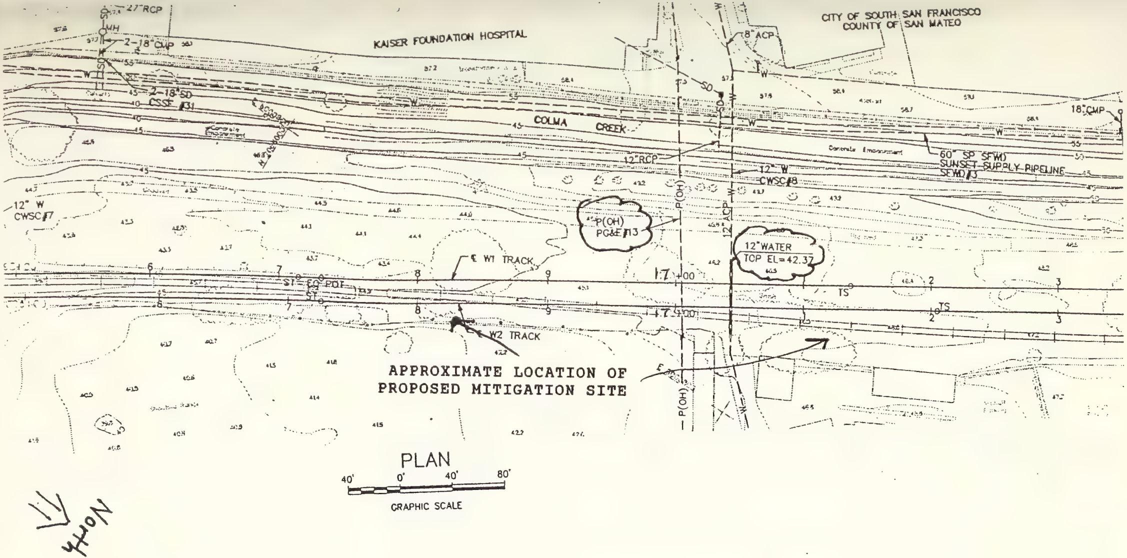

FIGURE III-1, APPROXIMATE LOCATION OF UTILITY CROSSINGS THROUGH PROPOSED MITIGATION SITE, EASTERN BANK OF COLMA CREEK

PROPOSED BART-SFO EXTENSION PROJECT
Corps File No. 19669S91

Map Source: Bay Area Transit Consultants
Drawing No. U208

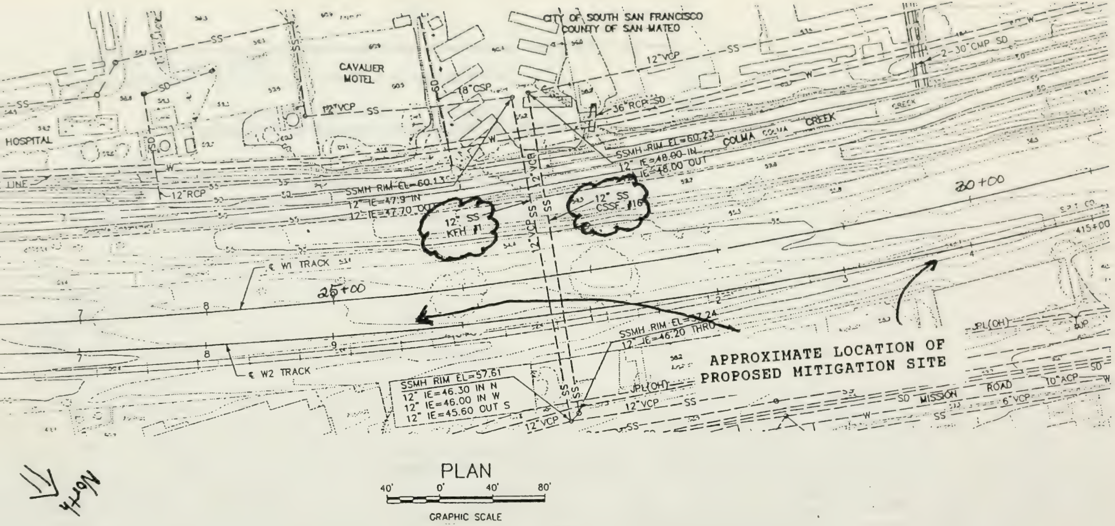

FIGURE III-2, APPROXIMATE LOCATION OF UTILITY CROSSINGS THROUGH PROPOSED MITIGATION SITE, EASTERN BANK OF COLMA CREEK

PROPOSED BART-SFO EXTENSION PROJECT
Corps File No. 19669S91

Map Source: Bay Area Transit Consultants
Drawing No. U209

All maintenance agreements will contain an understanding between BART and the specific utility that any maintenance activities within the confines of the proposed mitigation site will require advance coordination with BART's Manager of Environmental Compliance. This advance notice to BART will permit contact with any concerned regulatory agencies, including the Corps, USFWS, and CDFG.

Those activities which may involve operations disruptive to the overall success of the site will require restoration performed at the expense of the utility. Restoration will be accomplished in conformance with this Proposal, and may require a Contingency Plan, additional replantings and/or monitoring, as agreed upon prior to the work with BART, the Corps, USFWS, and CDFG.

This proposed mitigation site is being designed to be situated on top of the proposed subway box. The proposed subway box will be ± 4 feet below the lowest point of the proposed mitigation channel bed, within the upstream reach of the proposed mitigation site. Should the engineers involved in the final design of the proposed subway box determine that the subway box requires an additional buffer separating it from the mitigation site creek, additional imported clean fill may need to be incorporated into the proposed mitigation design. In such a case, BART will also address how drainage will be improved for the properties immediately northeast of the proposed mitigation site.

With the current ± 4 feet of dirt cover, future necessity to maintain the subway box from the outside, namely through excavation in the proposed mitigation site, is not anticipated. However, all BART post-construction documents, drawings, as-built plans, etc., of this portion of the proposed subway box will clearly designate the proposed mitigation area as a sensitive site. These documents will direct the BART representative of any potential project within the proposed mitigation area to coordinate with BART's Manager of Environmental Compliance. As such, any future projects sponsored by BART, disruptive to the mitigation site, would be held to the same guidelines and standards as previously discussed in relation to the various utility crossings.

F. Present and Proposed Uses of All Adjacent Areas

Along the southwesterly edge, the site is separated from the existing Colma Creek channel by an access road utilized occasionally by the Water Department and/or local vehicular and foot traffic. Following the construction of the proposed alignment through this reach, the access road will be eliminated and replaced by an earthen berm associated with the improved Colma Creek FCC.

Zoning of these two areas is "public", and will remain so in the future.

Numerous parcels border the northeasterly edge of the proposed mitigation site. Uses vary from residential, including condominiums, to light commercial. Specific zonings vary similarly.

All current land uses of adjacent properties are likely to continue, with or without the proposed project.

A proposed bike path is to be located in the vicinity of this proposed mitigation site. Development plans are just beginning, and therefore no specific alignment is available. This process will incorporate all mitigation site requirements to avoid encroachment and/or management conflicts between these two uses.

IV. RESTORATION DESIGN

This document not only proposes development of habitat mitigation through compensation by creating wetland habitat out of uplands for unavoidable permanent impacts, but also will provide habitat restoration for waters of the U.S., in those cases where project impacts are temporary. Temporary impacts to jurisdictional areas are those which are associated with the proposed project construction where the affected area is to be replaced at the same or contiguous location following the conclusion of construction.

This section has focused primarily on areas which currently possess several functions, although at times marginal. In most cases, concrete-lined ditches or canals, or shallow dirt-lined ditches are not incorporated into the guidelines in this section, since they will be restored to a similar state, limiting habitat restoration efforts.

A. General Types of Habitats to be Restored and Locations

The following areas of waters of the U.S. currently supporting habitat values and slated for proposed temporary project impacts are listed below according to habitat type. The specific proposed temporary impacts are listed within the brackets, followed by the approximate areal extent of proposed temporary jurisdictional impacts.

1. Habitat Type--Vegetated ditches, swales, or creeks:
    a. **Site 2-3a**, western portion of Cupid Row Canal for approximately 300 l.f. downstream of Huntington Avenue [relocation northward to resolve conflict between existing canal and proposed subway box]. Temporary impacts, 0.06 acre.

    b. **Site 2-3b**, northern tributary to Cupid Row Canal [proposed subway construction]. Temporary impacts, 0.05 acre.

    c. **Site 2-6a**, San Felipe Canal at the vicinity of the proposed northern aerial wye intersection [proposed at-grade mainline tracks, car wash access road, and retaining wall]. Temporary impacts, 0.16 acre.

    d. **Area 2-9**, extreme southern end of San Felipe Canal [proposed construction of a column footing associated with southern aerial wye stub]. Temporary impacts, 0.03 acre.

    e. **Site 2-10d**, drainage ditch south of main tributary to South Lomita Canal, east of Caltrain [at-grade track transition into proposed subway box]. Temporary impacts, 0.03 acre.

TOTAL ACREAGE OF DITCHES, SWALES, CREEKS, WITH HABITAT, TO BE RESTORED: 0.33 ACRE

2. Habitat Type--Seasonal herbaceous wetlands:

   a. **Site 2-3d**, two isolated seasonal wetlands, south of Cupid Row Canal [proposed contractors' laydown area]. Temporary impacts, 0.04 acre.

   b. **Area 2-6b**, shallow seasonal freshwater wetland, east of San Felipe Canal [proposed aerial wye support column construction]. Temporary impacts, 0.02 acre.

   b. **Area 2-8**, seasonal wetland pond adjacent to Highway 101 [proposed northern aerial wye and proposed PG&E tower raising construction]. Temporary impacts, 0.33 acre.

TOTAL ACREAGE OF HERBACEOUS SEASONAL WETLANDS TO BE RESTORED: 0.39 ACRE

3. Habitat Type--Mixed herbaceous and willow thicket:

   a. **Site 2-1b**, seasonal freshwater wetland with willow thicket, north of site 2-1a and South Spruce Avenue [proposed subway construction]. Temporary impacts, 0.25 acre.

   b. **Site 2-3c**, seasonal wetland pond, with willows, adjacent to Highway 101 [proposed temporary access road to contractors' laydown area on West of Bayshore Parcel]. Temporary impacts, 0.09 acre.

TOTAL ACREAGE OF MIXED HERBACEOUS AND WILLOW THICKET, TO BE RESTORED: 0.34 ACRE

The reader should refer to Table II-1 and Section II.C.2. for specific details on current jurisdictional impact site characteristics. Appendix A should be consulted for precise site locations. Total acreage of waters of the U.S., with existing habitat values, to be restored by this proposed project is approximately 1.06 acre.

B. Restoration Guidelines

Generally, the temporary impacts associated with this proposed project can be broken into three kinds, those involving placement of fill over/into waters of the U.S.; those which consist of excavation and similar disturbances within waters of the U.S.; and those which will involve relocation/realignment of a particular water of the U.S..

In all cases, regardless of type of impacts, sites will require plant, soil, and hydrological inventories prior to proposed project disturbance. These inventories will be furnished by the implementation biologist, and will include detailed plant lists, documented with pertinent site photos; characterization of the soils within the subject waterbody/wetland; and recordation of hydrological conditions/indicators.

Concurrently, erosion control plans will be developed, by the responsible contractor(s) and approved by BART, for those areas where proposed construction impacts are affecting only a part of a specific water of the U.S., so as to provide protection to adjacent areas not directly disturbed by the proposed construction activities.

General Restoration Guidelines:

All contractors, and their crews, working in and around sensitive aquatic habitats, especially in the vicinity of the West of Bayshore Parcel, will receive preliminary environmental awareness and compliance training prior to commencement of work. Such training will, at a minimum, discuss the various issues associated with a particular site or series of sites, including the importance of maintaining erosion control devices and the water quality of adjacent aquatic habitat; sensitivity of specific biotic resources such as the SFGS; any restrictions on activities, such as fueling, within a specific site; etc..

This training will also address the importance of staying within defined work limits; and outline what kind of activities should not occur within these areas. Similar training will be scheduled on a regular basis to ensure compliance with these guidelines.

In all cases, the minimum amount of area necessary to accomplish the proposed construction task will be identified, and clearly marked in the field with bright colored fences and/or silt fencing, or similar devices. These fences will define the limits of the proposed construction activities, and the contractors and their crews will be directed, during the environmental awareness and compliance training, to avoid encroachment beyond these protective fences.

All required and approved erosion control plans will be implemented prior to commencement of adjacent construction activities. The contractors will provide regular maintenance to these protective fences to ensure that they are functional for the duration of the construction.

Those temporary impacts caused through placement of fill over/into waters of the U.S.; and those which consist of excavation and similar disturbances within waters of the U.S. will require additional guidance to ensure successful restoration, as listed below.

"Waters of the U.S. disturbed by fill operations":

1. No grubbing of vegetative material, including roots, will be permitted. Minimal trimming of large vegetative masses, such as might be expected with willows, tules, etc., will be permitted, performed under the guidance of the implementation biologist. If at the proper season and appropriate site, this exercise may also include collection of selective seed by the implementation biologist, for storage until the time of restoration.

2. Protective mats, filter fabric, or similar mechanisms will be utilized to cover the vegetation of the water of the U.S., for the duration of the fill. Laying of these mats will be performed under the observation of the implementation biologist. Prior to commencement of this task, the contractor will provide material samples of proposed mats to the implementation biologist and BART's project engineer, for their review and final approval.

3. Activities allowed atop of these fills will be limited to those which do not involve fueling of equipment; storage of heavy equipment, fuels or other hazardous materials; etc..

"Waters of the U.S. impacted by excavation or similar disturbances":

1. The initial phase of preparation of the site can include seed collection and/or plant salvaging, if determined essential by the implementation biologist. Collected seeds or salvaged plants would be properly stored, under the direction of the implementation biologist, for subsequent reintroduction to an impact area. Such salvaging can also include removal of the top several inches of soils/organics from a specific water of the U.S.. These soils would be stockpiled and stored in an adjacent protected site, until available for reintroduction in conjunction with the restoration. All salvaging will be performed under the direction of the implementation biologist.

C. Preparation of Specific Restoration Plans

As discussed in the above section, the restoration guidelines will be followed to maximize protection to the areas of waters of the U.S. while in the disturbed condition. However, there will also be a restoration plan prepared for each of these areas, during the construction period, to guide all phases of restorative work. These restoration plans will rely on the data collected in the pre-disturbance inventories.

Restoration plans will include, at a minimum, guidance for removal of fill and protective mats; techniques to restore hydrology, soil compaction and permeability; and guidance to reestablish a comparable plant community as existed prior to the project impacts.

Plans will be prepared by a qualified biologist and provided to the Corps, CDFG, and USFWS, for review and comment, prior to implementation.

Each restoration site will be subject to similar annual monitoring as will be the mitigation site (see Section VII.). Specific success criteria will be developed and presented in each restoration plan, reflective of the subject restoration area.

D. Schedule of Disturbances and Restoration

It is conceivable that some areas, especially those involving fill, may remain in a disturbed state for as long as 2 - 3 years, the anticipated construction period.

For those areas which may be disturbed for shorter periods, restoration may occur sooner. However, restoration will occur only when there is assurance that all construction is completed within a particular portion of the project, as determined by BART's project engineer and the implementation biologist, and which can be protected from future construction impacts associated with this proposed project.

V. MITIGATION DESIGN

A. Type and Extent of Habitat to be Created

It is the intent of this Proposal to develop a mitigation site which will parallel the easterly bank of a portion of the reconfigured Colma Creek FCC, downstream of the proposed BART SSF Station. The proposed mitigation site will be graded to allow for the conveyance of a year-around low velocity creek across it. Low flows will average between 1.25 feet deep in pools to 6 inches deep in riffle areas.

The site will be planted to encourage development of adjacent wetlands, with varying hydrological regimes. Transitional upland areas will also be created. Some limited plantings of noninvasive riparian species will also occur, outside of the mitigation site, along the eastern slope of the berm associated with the FCC.

Table V-1 summarizes the types of habitats permanently lost as a result of this proposed project. It also provides acreages of types of habitats to be recreated in this mitigation site.

Overall, this Proposal will create approximately 0.66 acre of low velocity creek channel and about 2.04 acre of adjacent wetlands, for a total development of an estimated 2.7 acres of jurisdictional habitat. The remaining area will be established as a transitional upland to wetland area, resulting in a whole mitigation site which will be about 4.0 acres in size.

B. Mitigation Design Factors

1. Hydrological Issues Considered with Mitigation Design (see also Appendix B, containing hydraulic and hydrologic reference document by Locher, 1996).

a. **Expected flows/duration of hydrology:** The flows through the proposed mitigation site will be year-round, based on data collected from a former gauging station at Orange Memorial Park, located about 1/2 mile downstream of the proposed mitigation site. Most summer flows are from excess irrigation runoff from the cemetery and golf course areas upstream of the proposed BART SSF Station.

The elevation of the diversion point was selected such that the water to the proposed mitigation site will be gravity fed, ensuring a future self-sustaining water source.

An 18-inch pipe will convey the water from the diversion in the adjacent FCC to the proposed mitigation site. Summer low flows in the FCC are expected to provide an approximate 0.5 cubic feet per second ("cfs") to the site. Peak flows will be governed by the conveyance pipe, which will have a maximum capacity of about 7 cfs. When flows in the FCC reach 12 cfs they will be adequate enough to deliver the maximum capacity of 7 cfs to the conveyance pipe. The proposed mitigation creek has been designed on the basis of these data and flow restrictions.

TABLE V-1.
SUMMARY OF PERMANENT PROJECT RELATED IMPACTS, BY HABITAT, VERSUS PROPOSED MITIGATION ACREAGE, BY HABITAT
PROPOSED BART-SFO EXTENSION PROJECT
Corps File Number 19669S91

Habitat Description	Total Acreage of Impacts	Calculated Acreage of Mitigation[1]	Proposed Acreage at Proposed Mitigation Site
Concrete-lined channel	0.46 acre	0.46 acre	
Ephemeral freshwater drainage swale with willow & berries	0.03 acre	0.03 acre	
Ephemeral freshwater drainage swale	0.1 acre	0.28 acre	
Seasonal freshwater pond, with emergents	0.543 acre	1.62 acre	
Seasonal freshwater wetland	0.02 acre	0.06 acre	
Permanently flooded freshwater canal with emergent vegetation & willows	0.02 acre	0.06 acre	
Permanently flooded freshwater creek with emergents			0.66 acre
Overbank flood areas with wetlands			1.4 acre
Seasonally saturated freshwater wetlands			0.64 acre
TOTALS	1.2 ACRE	2.5 ACRES	2.7 ACRES

1. Due to the variety of location and habitat functions and values of the jurisdictional impact sites, replacement ratios for permanent impacts also vary. Low-quality wetlands or waters of the U.S. have been defined for this proposed project as those supporting limited wetland vegetation and/or wildlife habitat. Replacement for low-quality wetlands or waters of the U.S. are being proposed at a 1:1 ratio. High-quality wetlands or waters of the U.S. have been defined for this proposed project as those in the vicinity of or which are known to support sensitive wildlife species. Replacement of high-quality wetlands or waters of the U.S. are being proposed at a 3:1 ratio (Ogden, DEIR/SDEIS, 1995). See Table II-1 for ratios proposed for specific jurisdictional impact areas.

The low flow channel within the proposed mitigation site will be bank-full at about 2 cfs, with a depth flow of 1.25 feet. Any excess water, between 2 and 7 cfs, will flood the adjacent overflow areas, providing zones for plantings of a variety of emergent wetland vegetation.

Based on gauging station records for Colma Creek, the mean daily flows in the period from November through April are above 10 cfs with sufficient duration to ensure that the overbank areas will be flooded for more than 30 days during this period, depending on the rainfall for the particular year. Colma Creek is a small watershed, so the duration of high flows is short, frequently lasting only a few hours. Therefore, in the proposed mitigation site, the overbank flooding will usually last less than one day, which implies frequent, short-duration flooding. During periods of extended rainfall, this overbank flood zone may be flooded up to three days or for the period of the rainfall, but the water will recede as soon as the rain stops, due to the size of the watershed. Consequently, the overbank areas in the proposed mitigation site will not be flooded for more than a few days at a time.

Based on the physical characteristics of the onsite soils, i.e., low permeability, it is predicted that the overflow areas will be saturated almost continuously throughout the year, when not flooded.

For a height of about one foot above the overflow areas, there will be a seasonal capillary fringe zone, enacted with the first overbank flood. This phenomenon will provide seasonally saturated soils, during the mitigation creek's flood season, to this adjacent elevational belt, enhancing hydrological variability and seasonal wetland vegetative chances.

Appendix D, Sheet 1, contains the conceptual grading plan which illustrates the proposed topography to be achieved over the proposed mitigation site in order to provide the various hydrological zones discussed above.

b. **Water quality:** The FCC will provide the water source for the proposed mitigation site. A diversion structure is to be installed upstream of the proposed BART SSF Station, at Station 51+50, as shown on Figure 6, Appendix B. Figure 7, Appendix B, provides a conceptual layout of the diversion from Colma Creek. Such a diversion point and design will provide a self-sustaining water supply.

The FCC collects run-off from an estimated 6.2 square miles upstream of the proposed diversion. Most of this watershed is developed, and upstream reaches are similarly contained within concrete lined channels. Nevertheless, during some of the heavier rainfall events there may be unacceptable sediment loads which could potentially be transported to the proposed mitigation site. In order to eliminate this possibility, the diversion inlet will be equipped with a sediment trap, as conceptualized in Figure 7, Appendix B.

Additionally, since most of this watershed consists of urbanized development, the chances for oil, grease, etc., within the water source are also a likely situation. Upstream of the stilling well portion of the inlet to the proposed mitigation site will be a sediment and grease removal chamber (see Appendix B, Figure 8). The purpose of this feature will be to separate the majority of petroleum based pollutants from the water source prior to introduction to the proposed mitigation site.

c. **Water control structures and features:** In addition to the sediment trap and grease removal chamber referenced above, the proposed mitigation site will contain several other features which will assist in controlling the creek within its design configuration.

1. Stilling well and inlet: Figure 9 of Appendix B illustrates the stilling well and inlet to the wetland. Water exiting from the grease removal chamber will flow into the stilling well. This stilling well has an overflow weir that will distribute inflows into the wetlands channel at a velocity compatible with the transport capacity of the channel. Inflows will not be concentrated by the inlet pipe culvert, and accordingly the erosional potential of the wetland channel will be reduced.

It will be necessary to place ± 6 inch riprap at the outlet from the stilling well for a distance of approximately 2 feet, to further prevent erosion, as shown on Figure 9, Appendix B. The boundary of the wetland channel, for mitigation credit purposes, will be located downstream of the well and associated riprap. Downstream of the riprap, Enkamat, or comparable geotextile erosion control matting, will be used in the channel bottom for another 6 feet to further control for any erosion possibility.

2. Channel Drops (Riffles): The proposed mitigation site has about a 15 foot drop in elevation from inlet to outlet. To ensure stability, the proposed mitigation creek channel will contain a series of drops, total of 28, which will function as grade control structures. These drops or weirs will be constructed of rock cobbles, varying in size from 9 to 12 inches (see typical details on Sheet 2, Appendix D). Each drop will average a height of 6 inches. Some will be constructed of rock formations laid at approximately 90 degree angles to the flows, to simulate natural creek drops, while others will be built on a wider angle, to imitate riffles found in natural creeks. Short drops like these will also keep the erosional forces within an hydraulically acceptable range for this creek channel and specific soil conditions.

Flat bottomed areas in the channel are to be created upstream of each of the drops, to spread the low flows out gently to a maximum of 6 inches, increasing the surface area for plantings, while maintaining channel stability.

3. Protection to channel bends: Channel bends are another area requiring special attention relative to erosion. The proposed mitigation site design has utilized the proper hydraulic guidance to reduce shear stresses and the potential for erosion in the channel bends. Nevertheless, to provide additional protection against erosion, channel bends will be reinforced with Enkamat, or equivalent. Vegetation will grow through and/or become rooted in the geotextile, thereby significantly increasing erosion resistance.

4. Outlet structure: The outlet will also be an engineered structure, discharging the flows from the proposed mitigation site back into Colma Creek. Figure 10, Appendix B illustrates this feature. A concrete apron will form the interface between the mitigation channel and the outlet structure. This apron will also define the downstream limits of the mitigation creek channel, for jurisdictional purposes. The outlet structure will contain a rack to collect any debris, primarily vegetative originating within the wetlands, preventing it from jamming up the outlet. The outlet pipe, sized at 24 inches, will have a greater capacity than the inlet to prevent excess flows from backing up into the wetland areas, and to allow for some direct runoff from rainfall on the proposed mitigation site itself.

5. French Drain: Since the proposed mitigation design will be creating saturated soil conditions underneath the proposed mitigation site, it is necessary to install a french drain to collect excess flows before they flow further northeast. The function of the drain will be to preclude any potential problems with soils and foundation conditions in the properties between the mitigation site and Mission Road (Locher, 1996). The french drain, standard perforated pipe, will be contained in a trench about 6 feet deep, lined with geotextile fabric, and filled with clean gravel. Sheet 2, Appendix D, contains a detail of the french drain.

See Section VIII concerning maintenance of these various engineered features.

2. Final Topography in the Proposed Mitigation Site

Appendix D, Sheet 1, contains the conceptual grading plan for this site. The proposed gradient of the mitigation creek bed was discussed extensively in the previous section. The cross-sectional slopes of the creek channel were also critically designed to encourage establishment of stable channel and soil conditions while creating opportunities for introduction and establishment of adjacent wetlands of varying hydrological regimes.

Section A-A on sheet 2 of Appendix D illustrates a typical cross-section across the proposed mitigation site. As shown, the channel bottom will average 6 feet in width (12 feet wide at bank-full) over the extent of the site. Slopes of 3:1, H:V, will define the banks of the low flow channel, as specified by the hydraulic design (Locher, 1996).

Beyond those banks, the slopes generally decrease in the overbank flood zone to between 10:1 to 20:1[1].

The seasonally saturated zone will have slopes which range through similar gradients. Several areas, however, have 2:1 slopes through this zone, likely exceeding the slopes for meaningful capillary fringe development. Within this zone, slopes exceeding 5:1 will have geotextile fabric applications.

The higher elevational gradients beyond the seasonally saturated zone vary tremendously, from very flat to steep. Those in excess of 5:1 will also be covered with geotextile fabric.

3. Vegetation

On the basis of the design hydrology, several zones will be available for planting of wetland vegetation. Two general wetland plant communities are proposed: Emergent wetland plant community; and seasonal wetland plant community.

Beyond wetlands, the mitigation site will also contain transitional, wetland to upland, plant communities.

Many of the plants proposed for introduction to the proposed mitigation site are currently present within the watershed, or in those adjacent watersheds associated with the West of Bayshore Parcel. Others have been selected on the basis of their adaptability and regional distribution as being appropriate to these sites. As such, this project will not be proposing any plant exotic to the local region. All suggested plants are to be California natives.

Source of plants and seeds will be from commercial nurseries, through contract growing, or possibly from transplantation/collection from project impact areas and/or adjacent watersheds.

a. **Emergent wetland plant community**

1. Creek channels: For the most part, the center of the low flow portion of the creek channels will be left unvegetated. Some pools behind the drops will contain quiet enough waters to allow for introduction of *Rorippa nasturtium-aquaticum* (water cress), OBL.

Algae will volunteer randomly within the low flows and pools. Excessive algal blooms should not be a major concern due to the constant movement of the creek water through the site. The edges of the channel, along the 3:1 slope forming the interface between the low flow channel and overbank flood zones, will be planted with species listed below including

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[1] Research on naturally occurring wetlands found that 10 of 12 natural wetlands measured in Oregon contained slopes flatter than 10:1, H:V, and that the slopes in 6 of these 10 were flatter than 20:1, H:V. Gentle slopes, that occupy a large expanse of the area between the upland and any inundated area, allow development of a wide expanse of wetland vegetation rather than a narrow bank of vegetation at the water's edge (Kentula, M.E., et al., 1992).

Scirpus fluviatilis (river bulrush), OBL
Scirpus californicus (California bulrush), OBL
Scirpus americanus (American bulrush), OBL
Scirpus acutus (hard-stem bulrush), OBL

2. Overflow/overbank flood zones (within 1 foot in elevation of top of low flow channel): As previously discussed, these zones will be periodically flooded, up to a foot, during the months of November to April, during normal rainfall years. Due to the low permeability of onsite soils and the phenomenon of capillary action, it is expected that this zone will be permanently saturated, if not to the surface, at least within the root zone (± 12 inches from the ground surface) of the target emergent wetland vegetation. The plants being considered for this zone include

Scirpus fluviatilis
Scirpus californicus
Juncus mexicanus (rush), FACW
Alisma plantago-aquatica (broad-leaf water plantain), OBL
Eleocharis macrostachya (creeping spikerush), OBL
Scirpus americanus
Scirpus acutus

All candidate plants are capable of tolerating periodic flooding as well as permanently saturated soils to varying depths in the root zone.

Several other plants will be introduced toward the interface between this and the seasonally saturated zone described in c., below, where the slope permits. The attempt is to establish these plants at a seasonal flooding level which will only be several inches versus up to a foot in depth. These plants would include

Lilaea scilloides (flowering quillwort), OBL
Juncus bufonius (toad rush), FACW
Psilocarphus brevissimus (woolly heads), OBL
Potentilla anserina ssp. pacifica (silverweed), OBL
Juncus xiphioides (iris-leaved rush), OBL
Juncus bolanderi (Bolander's rush), OBL

b. Seasonal wetland plant community

1. Seasonally saturated/capillary fringe areas (within 1 foot in elevation of overflow zones): These zones will provide an environment conducive to plants adapted to seasonally saturated soils, primarily in the early part of the growing season. They will include both annuals and perennials such as

Danthonia californica (California oatgrass) FACW

Deschampsia caespitosa (tufted hairgrass), FACW
Leymus (Elymus) triticoides (creeping wild-rye), FAC
Hordeum brachyantherum (meadow barley), FACW
Juncus mexicanus
Equisetum sp. (horsetail), FAC
Juncus xiphioides
Juncus bolanderi

c. **Transitional wetland/upland areas (from 2 to 4 feet above in elevation of the overflow zones):** These areas will be planted with a variety of transitional plants, and will extend from the top of the seasonally saturated zone to the top of the eastern slope of the FCC berm. They would include those noninvasive plants with deep roots, adapted to seasonally saturated soils; or more shallowly rooted plants suited to drier conditions. Candidates for introduction consist of

Leymus triticoides
Sisyrinchium bellum (blue-eyed grass), FAC
Stipa pulchra (purple needle grass), UPL
Eschscholzia californica (California poppy), UPL
Rosa californica (California wild rose), FAC
Sambucus mexicana (blue elderberry), FAC
Salix lasiolepis (arroyo willow), FACW
Hordeum brachyantherum
Vitis californica (California wild grape), FACW
Lupinus nanus (Douglas' lupine), UPL

Salix lasiolepis will be introduced along the FCC berm, in limited numbers, in a position where roots will reach toward the water source in the mitigation wetland as opposed to that in the FCC.

Volunteer plants which might occur within the mitigation site, within this and higher zones, might include *Rubus discolor* (Himalaya blackberry), FAC. Several thickets are currently within the area, contained in the proposed project right-of-way. There will be no initial control proposed for these blackberries, unless determined by the implementation biologist that their distribution increases competition with other volunteer or intentionally placed plants, and reduces success criteria. Any such control will be preceded by preparation of a Contingency Plan, circulated to the Corps, USFWS and CDFG for their review and approval.

C. Functions and Values of Habitat to be Created

The proposed mitigation site will be reintroducing a natural creek back into the vicinity of Colma Creek. A low velocity channel will meander through the site, and numerous pool and riffle complexes will be developed. These areas will provide habitats which will be used by aquatic insects and insect larvae; as well as amphibians. These animals would feasibly include a variety of water beetles; water striders; water boatmen; dragonfly, damselfly, mayfly, and stonefly larvae and adults;

VI. MITIGATION PROJECT IMPLEMENTATION PLAN

A. Site Preparation

"Pre-Construction Activities"

1. Pre-construction meeting: Prior to implementation of this Plan, a pre-construction meeting will be held with the Implementation Biologist, BART's Supervising Project Engineer, and the selected contractor, equipment operators, and/or laborers involved with mitigation site implementation or any adjacent ongoing construction associated with the proposed BART-SFO Extension Project. Purpose of this meeting will be to make all parties aware of the sensitivity of this project; various goals; and very specific details and constraints necessary to development of a successful mitigation project.

Similar training will be given prior to each phase associated with this proposed mitigation project, or with change of construction personnel.

2. Erection of perimeter fences to protect proposed mitigation site: The proposed mitigation site will be provided with a temporary perimeter fence during the construction phase. The purpose of this fence will be to prevent public access into the site during earth moving activities.

A permanent perimeter fence will be installed around the proposed mitigation site when all earth movement is completed. It will be of chain link, approximately 6 feet in height. The bottom will be installed at about 6 inches above the ground surface to permit small mammals free movement in and out the site. See Appendix D, Sheet 1, for the final fence alignment and access gates.

Two gates will be provided to the site which will be locked to prevent incidental entry. Keys to these gates will be under the control of BART's Environmental Compliance Manager.

"Construction Activities Associated with Mitigation Implementation"

1. Grading of mitigation site: The first part of the mitigation implementation will involve the grading of the low flow channel and associated wetland and transitional zones, in accordance with the Conceptual Grading Plans, Appendix D, Sheet 1. Included in this phase will be the installation of the rock weirs and geotextiles along channel curves and designated slopes. A surveyor will be onsite during all grading to ensure that proper grades and slopes are being achieved. The implementation biologist will be onsite during all construction to confirm that the project is being executed in a manner commiserate with achieving the mitigation goals.

Any excess fill material generated from the proposed mitigation site will be removed, and placed either along another portion of the proposed BART alignment or into a site outside of waters of the U.S..

All earth moving activities within the proposed mitigation site will be scheduled to occur during the summer months, after soils have dried. This schedule will reduce the amount of excess soil compaction which can accompany any project involving large earth moving equipment.

Following completion of all earth moving activities, the ground surface in the proposed mitigation site will be lightly broken up, with either hand tools or small rototillers, to reduce compaction and/or soil polishing, both of which are inherent to earth moving activities. Such a procedure breaks up the top 2 - 3 inches of the new ground surface, aerating it to make it more receptive to root growth, especially of seeds.

2. Construction of all engineered features: The final element of implementation in the proposed mitigation site construction will be the fabrication of all the engineered features. This phase will include final installation of the conveyance pipe between the diversion structure in the FCC and the proposed mitigation site. This will also be when the sediment trap near the diversion is constructed as well as the grease removal chamber; inlet with stilling well and riprap; outlet structure with debris rack; french drain; and downstream connection back into the FCC. The diversion structure in the FCC will be constructed concurrent with the FCC upgrading project.

Each of the areas associated with the engineered features will be physically separated from the proposed mitigation site during construction with appropriate barriers (silt fences, wooden barricades, etc.). These barriers will function to contain any excavated fill, concrete, etc., within the specific construction area. All construction areas are to be completely cleaned up prior to removal of these physical barriers. Similarly all barriers are to be disposed of offsite, at an approved disposal site.

3. Installation of erosion control devices: Concurrent with the completion of varying phases of proposed mitigation site construction will be the installation of erosion control devices which will function to protect the low flow channel and overflow areas until emergent vegetation can adequately provide its protection to the creeks.

These devices will be located above the design overbank flood zones, and will include properly installed silt fences; straw bale or gravel bag barriers; etc.. Design of these features will be completed prior to commencement of any earth moving operations on the proposed mitigation site, to be performed by a qualified engineer.

"Post-Construction Activities"

1. Maintenance of Erosion Control Features: The key to a successful erosion control plan is to provide the necessary maintenance at various critical thresholds, as described below. This Proposal will provide such maintenance. Inspections,

including repairs, cleaning, etc., will occur following the conclusion of each construction day, to ensure that previously installed devices were not knocked down by that day's activities. Maintenance will also follow all planting activities in the overflow areas; after the first series of rains; and after the planting of all other portions of the proposed mitigation site. Throughout the first rainy season following mitigation implementation, additional inspections and maintenance of erosion control devices will be provided following all significant rainfall events.

Maintenance will be performed under the guidance of the implementation biologist to ensure that these activities are performed in a manner sensitive to the goals of this mitigation site.

The erosion control plan will contain contingencies to respond to various erosion problems. Minor erosional problems will be dealt with during any of the maintenance events. A summary of these activities will be provided to the Corps, USFWS, and CDFG in conjunction with the first annual monitoring summary report.

No major problems or failures relative to erosion within the proposed mitigation site are expected, but the contingencies in the erosion control plan will identify interim measures to be implemented to stabilize the site for the duration of the rainy season. These contingencies will also provide for any redesign necessary to provide stability to the proposed mitigation site relative to soil erosion.

The Corps, USFWS, and CDFG will be kept informed of any such major situations, and also be provided with redesign information, for their review and comment, prior to implementation. If the situation is an emergency, all agency contact will occur via telephone and/or facsimile mail.

2. Maintenance of All Engineered Features: During Year 1 following implementation, BART maintenance crews will be providing maintenance to all of the various engineered features following each rainfall event, until an appropriate maintenance plan and schedule can be developed based on this first year's experience. The ultimate schedule produced from this first year's experience will be provided to the Corps, USFWS, and CDFG as a part of Year 1's annual monitoring summary report.

3. Soil Testing within Mitigation Area: Upon completion of all grading activities, soil samples from each of the designed zones, including the 3:1 slope associated with the low flow channel, will be collected from the mitigation site. Agricultural level soil tests will be performed on these samples to identify if there exist any soil deficiencies which might preclude development of a healthy plant community. Any prescribed soil amendments from these tests will be added prior to or in association with the proposed plantings.

4. Planting of Low Flow Channel and Overflow Areas: This activity will follow within approximately two - three weeks of introduction of flows into the proposed mitigation site. According to the hydrologist, it is anticipated that soils will become saturated and flows across the entire low flow channel will be evident within a week or two after the supply of water commences (Locher, 1996). Accordingly, these zones will be saturated to the same level as the water in the low channels, allowing for planting of emergent vegetation into these areas.

Several test pits, to 12 inches in depth, will be dug within the overbank flood zone during the second week to confirm this assumption. If necessary, additional pits will be dug in week 3, to avoid planting of emergents prior to development of adequate hydrology.

See Section VI.B. for further details concerning these plantings.

5. Eradication of Invasive Plant Species: This task is to be performed throughout the monitoring period of this proposed mitigation site, and the reader should refer to Section VIII for further details.

During the first year following implementation, however, this task is extremely critical to reduce competition to the intended plant community, and with this site, to also assist in mosquito control. As such, plant eradication activities will be more frequent than in subsequent years. There are several plants which could potentially become nuisances to the mitigation site, including

Typha spp.
Xanthium spp. (cockleburs), FAC
Cynodon dactylon (Bermuda grass), FAC
Cortaderia selloana (pampas grass), UPL

Plant control will be manual, utilizing hand tools, to dig up the plants with all their roots. All plants and roots will be removed from the site, and disposed of properly. Should control of a particular plant prove unsuccessful by these means, a contingency plan will be prepared and submitted to the Corps, USFWS, and CDFG for their review and comment, prior to implementation.

6. Monitoring of Tree Sprouts, Perennial Plant Plugs and Seeds, First Rainy Season/Early Spring, After Implementation: From experience, it is the first year which is the most critical to plant and seed survival. Therefore, in addition to the intensive monitoring to be provided to erosion control devices, this Proposal also intends to furnish intense monitoring to all plantings through the first rainy season and spring. In some cases, such monitoring can be functional in identifying plant or seed mortality soon enough to allow for another planting or seeding during the same rainy season, increasing the overall success of plant community establishment.

Similarly, for this proposed mitigation site, such monitoring might also quickly identify whether there is going to be a problem with vandalism, and attempt to rectify the situation early in the monitoring period.

B. Seeding and Planting

Several previous sections in this report have discussed the proposed plant communities to be introduced to the various zones of the proposed mitigation site. This section addresses the types, sizes, and potential sources of the intended plant community.

1. Low flow channels: The only plant being considered for introduction to the creek bottom will be watercress, along the edges of some of the quieter waters expected to develop upstream of a drop structure. Currently there are no commercial native plant sources which have been identified for plugs. Therefore these plants will likely be transplanted from plugs taken from other creeks along the project reach, or from neighboring watersheds. Plugs will be borrowed and transplanted during the course of one day, temporarily stored in buckets of water while in transit between sites.

There will also be opportunities to salvage watercress from temporary impact areas. If salvaging and storage procedures, under direction of the implementation biologist, prove successful, they may provide another source for the watercress.

The 3:1 banks are also to be planted with emergents, as discussed in item 2., below.

Schedule for planting of the low flow channels will be concurrent with that of the overflow zone, within several weeks following introduction of water to the creek channels (see Section VI, "Post-Construction Activities", 4., above).

2. 3:1 banks associated with low flow channel, and overflow zones: These areas are to be planted with emergent wetland vegetation of varying heights, 1 to +5 feet. Taller members will be planted closest to the low flow channels, where during a maximum flood water depths can reach from 1 foot to + 2 feet. Conversely shorter plants will be placed along the intersection between the overflow and seasonally saturated zones.

In order to establish these plantings quickly, to function as controls to the design of the low flow channel, these plants will be introduced as plugs (consisting of a root and stem) or as one gallon stock. As with watercress, preliminary investigations indicate that none of the candidate plants are readily available through commercial sources. Plugs will need to be acquired from local adjacent watersheds, and planted out the same day; or contract grown from salvaged or borrowed stock, in which case plants will likely be of one gallon size.

3. Seasonally saturated/capillary fringe zones: Plantings or seedings of the last two higher zones of the proposed mitigation site will await the onset of the fall/early winter rains.

In the case of the seasonally saturated zones, plants will be introduced as plugs, if obtained from local borrow sources. In addition, plants may be obtained through commercial sources, or be part of a contract growing operation. In those cases, plants will likely be one gallon units.

In addition, seeds of some of the grasses will also be hand sown throughout this zone, to further encourage a quicker establishment of the plant community. Hand seeding will follow the planting of all sprouted individuals.

4. Transitional wetland/upland areas: Similar scheduling and planting/seeding as proposed for zone 3., above, will be utilized.

5. Option of contract growing plants: As implied in some of the preceding sections many of the candidate species are not readily available from commercial sources. If necessary, plants will be contract grown to obtain the necessary number and varieties of plants for the proposed mitigation site. In those cases, plants will likely be of one gallon size.

In such a case, a grower will be selected from within the Bay Area, with a request that plants be obtained, if necessary, from local sources within or in the general vicinity of the proposed project alignment. This grower will also be involved in the various salvaging opportunities which will be available in conjunction with project construction.

C. Schedule

Mitigation implementation will not commence until after the proposed subway construction and Colma Creek FCC reconstruction are completed through this project reach. As such, mitigation construction may occur two years after commencement of construction on this project, or in the year 1998 to 1999.

D. Irrigation Plan

This Proposal does not include an irrigation plan, since all planned plantings and seeding events are being scheduled to coincide with natural availability of water to the proposed mitigation site, including regional rainfall patterns. For emergent plants, available water is anticipated to develop to within 12 inches of the ground surface within 2 - 3 weeks following introduction of creek flows (Locher, 1996). For the remaining higher planting zones, all plantings will occur after the onset of the fall to winter rains.

An irrigation plan will be developed should no rains develop by the first of January following mitigation implementation, to permit for the plantings and seedings in the seasonally saturated and transitional zones to occur. This plan will be circulated to the Corps, USFWS, and CDFG, for review and comment, prior to implementation. There are several adjacent water sources which can be utilized to provide such irrigation, including local wells and city water.

Similarly, if all plantings and seedings occur after commencement of fall to winter rains, and these rains suddenly fail to continue into the spring (i.e., rains fail to follow expected normal rainfall patterns), a similar irrigation plan will be developed to support the installed plantings and seeds.

E. As-Built Reports

Following completion of each implementation phase of mitigation or restoration, the implementation biologist will prepare a summary report recounting project execution. Such phases would include earth-moving activities; planting events; etc..

In conjunction with each summary report, if there were any deviations from the attached conceptual grading plans contained in Appendix D of this document, or any specific restoration plan, as-built drawings will be prepared and supplied to the Corps, USFWS, and CDFG, concurrent with submittal of the summary report.

All summary reports will be provided to these agencies within six weeks of completion of a particular activity.

VII. MONITORING PLAN

A. Performance Criteria

The criteria provided in this section will be utilized to determine annual and final success of the proposed mitigation project. There are two main categories of achievement which can be assessed in making the determinations of a successful implementation. They are related to vegetative growth and the hydrological regime. As such, measurable goals associated with these two categories are being provided in this section as final success criteria, as well as annual targets.

Secondary indicators of successful implementation of the mitigation design will also be considered with this Proposal. The first of these involves recording the use of the site by wildlife, on an annual basis. Although not proposed as a mandatory success criterion, such information can be helpful to evaluate how an area is developing.

The other secondary indicator to be considered with this Proposal concerns development of characteristics which would describe the mitigation site as fitting the definition of a tributary of the U.S., with adjacent wetlands, pursuant to the CWA. This determination will be included as one of the mandatory final success criteria.

A summary of the annual success criteria are included in Table VII-1.

1. Final Success Criteria

a. **Target Hydrological Regime:** Final success will be reached for this element when it is determined that the mitigation creek channel, up to and including the overbank flood zone, are geotechnically stable at the end of the monitoring period. Such a determination will involve evaluation of the creek bottom and banks as to maintained stability relative to erosion and/or scouring; and permanence of the various drop structures. To meet this specific final success criterion, it will also be necessary to confirm that capillary fringe activity is seasonally evident to ± 1 foot above the top elevation of the overbank flood zone.

b. **Target Vegetative Criteria:** As this Proposal intends to develop different plant communities, final success criteria for each plant community is given below:

1. Emergent and seasonal wetland plant community: Final success will be met if, by Year 5, it is documented that these areas contain 90% absolute cover by the target wetland plants. Evidence of good health, vigor, and signs of reproduction within the plant community must also be present.

2. Transitional trees, shrubs and vines: Final success criteria for this portion of the plant community will require that the overall community exhibit signs of good health; indications of natural recruitment; and continuing

TABLE VII-1
SUMMARY OF ANNUAL SUCCESS CRITERIA AS DETAILED IN SECTION VII.
Mitigation and Restoration Proposal, Proposed BART-SFO Extension
Corps File Number 19669S91

Category	Year 1	Year 2	Year 3
Hydrology:	(1) Overall assessment of mitigation channel must determine that channel and lower banks are geotechnically stable (2) Site must exhibit formation of three design hydrological zones	Same as Year 1	Same as Year 1
Vegetation: a. Emergent wetland plant community	Total absolute cover, 25%, by emergent wetland plants Overall good health and vigor of plant community must be present	Total absolute cover, 35%, by emergent wetland plants Overall good health and vigor of plant community must be present	Total absolute cover, 50%, by emergent wetland plants Overall good health and vigor of plant community must be present
b. Seasonal Wetland plant community	Total absolute cover, 25%, by seasonal wetland plants Overall good health and vigor of plant community must be present	Total absolute cover, 35%, by seasonal wetland plants Overall good health and vigor of plant community must be present	Total absolute cover, 50%, by seasonal wetland plants Overall good health and vigor of plant community must be present
c. Transitional, Wetland to Upland, plant community 1. Understory	Total absolute cover, 25%, by herbaceous transitional plants Overall good health and vigor of plant community must be present	Total absolute cover, 35%, by herbaceous transitional plants Overall good health and vigor of plant community must be present	Total absolute cover, 40%, by herbaceous transitional plants Overall good health and vigor of plant community must be present
2. Trees, shrubs & vines	Minimum 80% survival of total plantings; minimum 20% survival within species	Same criteria as in Year 1	Take measurements in each vegetative stratum for percent cover/size and density of growth to set Years 4 & 5 criteria Must document new growth, freedom from disease; & good root development within community and species

Category	Year 4	Year 5
Hydrology:	Same as Year 1	Same as Year 1
Vegetation:		
a. Emergent wetland plant community	Total absolute cover, 75%, by emergent wetland plants Overall good health and vigor of plant community must be present	Total absolute cover, 90%, by emergent wetland plants Overall good health and vigor of plant community must be present
b. Seasonal wetland plant community	Total absolute cover, 75%, by seasonal wetland plants Overall good health and vigor of plant community must be present	Total absolute cover, 90%, by seasonal wetland plants Overall good health and vigor of plant community must be present
c. Transitional, wetland to upland plant community		
1. Understory	Total absolute cover, 45%, by herbaceous transitional plants Overall good health and vigor of plant community must be present	Total absolute cover, 50%, by herbaceous transitional plants Overall good health and vigor of plant community must be present
2. Trees, shrubs & vines	Increase in percent cover/size by 15% over Year 3 measurements Must document new growth; freedom from disease; good root development; & signs of reproduction or recruitment; within community and species	Increase in percent cover/size by 30% over Year 3 measurements Must document new growth; freedom from disease; good root development; & signs of reproduction or recruitment; within community and species

structural development. Structural development is to be measured through documentation of the density of growth and percent cover. Each vegetative stratum will be measured separately, as well as the overall community. Increases in growth, density, and percent cover will be required to meet a minimum of 30%, by Year 5, as compared to data collected in Year 3.

3. Transitional herbaceous plant community: Final success will be achieved when there is a minimum of 50% absolute cover by transitional non-woody plants. Overall good health, vigor, and signs of reproduction within the plant community must also be present.

c. **Wildlife Usage:** This specific element is not a success criterion. This element will be monitored annually with this Proposal, as a secondary indicator of community development. Within an urban setting, there can be various reasons why a wetland habitat might not develop the expected wildlife use, many of which would be completely out the control of BART relative to remedies.

Section V. has speculated on future wildlife use by the proposed mitigation site. If final monitoring fails to show signs of development of such functions, then an analysis to determine possible reasons will be conducted and proposed remedies will be developed, if within the control of BART.

d. **Target Jurisdictional Acreage to be Created:** A jurisdictional determination, utilizing current Corps regulations and guidance, will be performed during Year 5 monitoring. The design of this Proposal intends to create 2.7 acres of aquatic habitat, involving a low velocity perennial creek with adjacent emergent and seasonal wetlands. The final success criterion will require that this proposed mitigation site has developed the characteristics of each of these "waters of the U.S.", as defined by the CWA, and at comparable acreages as proposed.

2. Annual Success Criteria

a. **Hydrological regime:**

Year 1: Monitoring will involve an assessment of the overall structural stability of the mitigation channel, up to and including the overbank flood zone. Structural stability will be measured by observation of the creek alignment for any signs of erosion and/or scour; failure of geotextile fabric protection; deficiency of a particular and/or series of drop structures; or similar evidence. The Year 1 success criterion is met if it is determined that the creek channel and lower banks are geotechnically stable.

The mitigation design has sought to eliminate sediment transport from the water source into the mitigation site. In addition, the channel's gradient is not likely to allow unacceptable accumulation. As such, this Proposal does not now propose to set a standard for this factor. Annual monitoring will look for signs of unacceptable sedimentation in making its determination that the creek is geotechnically stable.

In addition, monitoring relative to the hydrological component will involve determination of whether in fact the projected hydrological zones are present in the mitigation site. Visual observation for signs of inundation (debris lines, signs of washing, etc.) into the overbank flood zone will confirm whether there are such events, if not directly observed. Seasonal saturation to one foot above the overbank flood areas will be made through observation of 6 soil pits. Year 1 success criterion will be met if all three target zones are confirmed through visual observations.

Years 2 - 5: Each of the ensuing years will involve similar monitoring with analogous annual success criteria.

b. **Vegetation:** As this Proposal aims to develop three distinct plant communities, it is necessary to develop individual annual success criteria for each of these plant communities, as discussed below.

1. Success Criteria Summary--"Emergent Wetland Plant Community":

Year 1: Total absolute cover, 25%, by emergent wetland plants (seeded, planted, or volunteer)

Year 2: Total absolute cover, 35%, by emergent wetland plants

Year 3: Total absolute cover, 50%, by emergent wetland plants

Year 4: Total absolute cover, 75%, by emergent wetland plants

Year 5: Total absolute cover, 90%, by emergent wetland plants

Overall good health and vigor of the plant community must be present with each monitoring threshold.

2. Success Criteria Summary--"Seasonal Wetland Plant Community":

Year 1: Total absolute cover, 25%, by herbaceous wetland plants (seeded, planted, or volunteer)

Year 2: Total absolute cover, 35%, by herbaceous wetland plants

Year 3: Total absolute cover, 50%, by herbaceous wetland plants

Year 4: Total absolute cover, 75%, by herbaceous wetland plants

Year 5: Total absolute cover, 90%, by herbaceous wetland plants

Overall good health and vigor of the plant community must be present with each monitoring event.

3. Success Criteria Summary--"Transitional, Wetland to Upland, Plant Community": Since this community will

include both understory plants, primarily herbaceous in nature; and an overstory composed of shrubby trees, shrubs, and vines, this community's standards are likewise subdivided.

With the understory plants, it is expected, as the trees and shrubs begin to mature, that there will be less space available for survival. Hence the success criteria reflect this likely outcome. Should the overstory exceed development expectations, it may be necessary to further lower these criteria, since priority will be given to that stratum over the understory.

a. Success Criteria Summary--"Transitional Herbaceous Understory Plants":

Year 1: Total absolute cover, 25%, by herbaceous transitional plants (seeded, planted or volunteer)

Year 2: Total absolute cover, 35%, by herbaceous transitional plants

Year 3: Total absolute cover, 40%, by herbaceous transitional plants

Year 4: Total absolute cover, 45%, by herbaceous transitional plants

Year 5: Total absolute cover, 50%, by herbaceous transitional plants

Overall good health and vigor of the plant community must be present with each monitoring event.

b. Success Criteria Summary--"Transitional Trees, Shrubs, and Vines":

Years 1 and 2: The annual success criteria for these two years will relate to percent survival of all of the overstory species which have been planted. There should be at the end of the second year, a minimum 80% survival of the total of these plantings. Individually, if a specific planted species should not attain a minimum 20% survival, an analysis will be conducted to determine a possible cause, to determine whether this species is possibly inappropriate for the specific site. Accordingly, such a situation will not necessarily cause the annual success criteria for the plant community to not be met.

Years 3 through 5: Since these plantings are diverse, the success criteria will depend not only on percent cover or size, but will also consider overall health and development of community structure within the overstory. Assessment on health will include indications of new growth; freedom from disease; and good root development (measured on random individuals of all planted species). These criteria are general for the planting zone, as well as for each planted species. Reproductive or recruitment evidence will also be evaluated.

Measuring development of community structure within the overstory will consist of a general assessment of this planting zone, and how it is interfacing with adjacent areas. The field evaluation will separate the plants by strata, where meaningful, such as tree stratum, shrub stratum, and vine stratum. Factors to be considered will include density of the growth and percent cover; indications of natural recruitment/reproduction; and whether the area is being invaded by exotics which might change the nature of the area.

The data collected in Year 3, relative to density of growth and percent cover will provide the control for the ensuing two years. There should be a measurable increase in these two elements from one year to the next, minimum 15%, within each stratum, if applicable, and overall within the clump or zone.

A clump or zone, or specific stratum, which meets the requirement of good health, but does not necessarily meet the minimum 15% measurable increase in density of growth and percent cover, may still meet the annual success criteria. In such a case, the annual monitoring report would need to thoroughly document the good health of the area/stratum, and provide possible reasons for the divergence from the required minimum increase. This kind of allowance would provide for minor zone or clump changes, year to year, which might occur due to the fact that part of this zone is outside of the mitigation site fence. Reproductive or recruitment evidence will also be evaluated.

c. Wildlife:

Monitoring for avian and other wildlife use will be performed annually for five years after project implementation. This monitoring will be utilized as a secondary indicator which might provide insight as to the development of the overall system into a viable habitat, but will not be included into any success criteria for the proposed mitigation site. Within an urban setting, there can be various reasons why a wetland habitat might not develop the expected wildlife use, many of which would be completely out the control of BART relative to remedies.

Section V. has speculated on future wildlife use of the proposed mitigation site. Each annual monitoring event will document direct observations and indirect signs of such use. In combination with the other criteria, this information could be useful in demonstrating habitat development.

B. Monitoring Methods for the Proposed Mitigation Site

1. Installation of station and elevational markers: To assist in monitoring efforts, following installation of the perimeter fence, and preceding Year 1 monitoring, permanent station markers, with elevations, will be surveyed in and positioned on both sides of the creek. These permanent markers will allow for a particular reach along the proposed mitigation site to be easily identified.

2. Hydrology: Monitoring of this criterion will involve direct observation of the mitigation channel, including the low flow channel and the overbank flood zone. The entire channel bed will be traversed, and signs of erosion, channel scouring, etc., will be noted. In the case of noticeable erosion, an in-field determination will be made as to the

potential affect it may have on the overall channel. If the determination is made that it appears that the erosional situation may have an adverse impact to the channel stability, a contingency plan will be prepared and provided to the Corps and CDFG for review and comment, prior to implementation. Minor erosional signs will be repaired as part of the annual monitoring, and noted in that year's annual monitoring report. The site will be flagged for future monitoring to ensure that in fact the situation is insignificant. Minor scour or erosion will not lead to a determination that the creek is geotechnically instable.

Capillary fringe action will be verified by digging a total of six randomly placed soil pits within the zone identified as seasonally saturated, to 12 inches deep, and making visual observations of depth of water and/or saturated soils within the pit. Three pits will be on the easterly bank and three will be on the westerly bank. Pit locations will be marked on a map of the site, and included with that year's monitoring summary report.

Annual general assessments as to the stability of the creek channel will occur in conjunction with the vegetative monitoring, at each of the ± 20 data points, as discussed below. These assessments will include looking for any of the signs previously discussed, such as erosion, scouring, etc. This kind of scrutiny, together with that previously addressed, will likely provide enough data to accurately assess stability.

3. Vegetation: Monitoring of this proposed mitigation site relative to the vegetative component will occur by using the low flow creek channel for a base line. Since it roughly splits the site into two pieces, it provides a convenient reference line for sampling points.

Data points relative to the achievement of annual and final success criteria will be placed at the intervals given by the station and elevational markers. At each station, all of the plant communities on either side of the creek will be sampled separately. Since the site is over 2000 l.f., it will allow for placement of ± 20 station and elevational markers, each approximately 100 feet apart. With such a sampling plan, each plant community will be sampled at least 40 times.

Each data point will consist of a 1 meter square quadrat. Each plant whose stem or canopy crosses into the quadrat will be identified, and an estimated percent cover assigned to that species. Wetland plant classifications according to the US Fish and Wildlife Service's National List of Plant Species that Occur in Wetlands: California (Region 0), May 1988 (see footnote on page II-3), will be assigned to each of the plant species, to rank the plant community relative to affinity to wetland conditions. Collected data will then be studied to determine absolute percent cover of all species along a transect, frequency of a particular species as well as any plant community dominants.

To determine when collecting data whether enough sampling points are being sampled, a test known as the **Species-Area Curve** (Federal Interagency Committee for Wetland Delineation, 1989) will be run on the raw data to determine adequacy of sampling. This test plots the cumulative number of species within the quadrats against the number of quadrats. The number of quadrats sufficient to adequately survey the sample will correspond to the point on the curve where it first levels off and remains essentially level. If the data within each transect passes this test, then monitoring will progress to the next transect. If not, additional samples will be taken, or the transect realigned to increase sampling reliability.

Ground photos will be taken annually from each station marker, looking over the creek channel to the opposite bank, to reveal the various sampled plant communities. Former years' photos will be mounted with those from the current year to provide comparison and visual documentation of community development.

a. **Emergent and Seasonal Wetland Plant Communities:** As previously discussed, within the emergent wetland plant community, there are two distinct sub-zones which are being proposed on the basis of depth of potential flooding. Along the 3:1 slopes associated with the low-flow channel, inundation, during flood events, could exceed 2 feet in depth. The lower half of the overbank flood zone is expected to be inundated during similar flood events to between 6 inches and 1 foot. Plants adapted to inundation from 6 inches to 2 feet form the first sub-zone. The upper portion of the overbank flood zone will be flooded during highest floods with 0 to ± 6 inches of water, forming the second sub-zone. Although the plants proposed for these two sub-zones are different, their mandatory annual success criteria are the same as are the proposed monitoring methods. Sampling of each sub-zone, however, as with different plant communities, will be separate.

b. **Transitional Wetland to Upland Plant Community:** The herbaceous portions of this community will follow the general discussion above for emergent and seasonal wetland plant communities. The shrubby tree, shrub and vine strata will follow the ensuing guidance.

During the first two years, the assessment of percent survival will occur on all planted individuals. If a specific plant species does not maintain a minimum 20% survival, an analysis to determine possible reasons for not achieving such survival will be made.

In the ensuing three years, monitoring of this plant community will be conducted at each of the data points, sampling 10 ft squares around each marker or comparable area in the vicinity.

The evaluation on overall good health of this plant community will involve the identification of the various species in each zone or clump, followed with documentation of signs of new growth; freedom from disease; and good root development, generally, within each species. A similar broad assessment will also be provided for each data point. If there is an inconsistency relative to these criteria within a species, then some counts of healthy versus sickly individuals will be made, and an assessment conducted to establish possible reasons for the discrepancies.

Measurement of community structure will consist of identifying the various strata present within a data point, and providing an assessment of each. As such, in the tree stratum, percent cover by the canopy (relative and absolute); stem density; and crown height will be determined. Signs of natural recruitment/reproduction and invasion by exotics which could change the nature of the area will also be noted.

For the shrub stratum, percent cover by a clump and/or individual shrubs will be noted, as will signs of natural recruitment/reproduction and invasion by exotics. Similar assessments of areas which might be vegetated by vine species will also be made.

As a summary evaluation of this general plant community, development of the overall canopy by these species will be conducted, to document the development of this transitional zone.

4. Wildlife: Evidence of wildlife use will be documented concurrent with the annual monitorings of the proposed mitigation site. This monitoring will involve recording direct observations and indirect signs of wildlife use on each day within the monitoring event. Collected information will be utilized in conjunction with the other annual and final success criteria as an additional indicator of habitat development.

C. Monitoring Schedule

Monitoring will be conducted annually relative to these various annual targets for a total of 5 years. At that time, the proposed mitigation site should meet its final success criteria. Failure to do so could result in preparation of a Contingency Plan to address solutions for failed elements.

Annual monitoring events will follow the ensuing schedule.

1. Hydrology: Monitoring relative to channel stability will occur concurrent with the annual monitoring for vegetation. Annually there also will be a second earlier monitoring which will occur during the month of February of any normal rainfall year. This particular schedule will increase the likelihood of accurate confirmation that the target hydrological zones are developing as planned. Abnormally dry years will require altering the schedule for the February monitoring, to be arranged in conjunction with the Corps, USFWS, and CDFG.

2. Vegetation and Wildlife: All other monitoring, as previously discussed in this section, will occur during the first two weeks of July of any given year.

D. Annual Reports

Annual summary monitoring reports will be provided to the Corps, USFWS, and CDFG (2 copies) within six weeks of the conclusion of the July monitoring.

Data analyses of February samplings will be provided in conjunction with annual summary monitoring reports, except where emergency remediation is required. In such cases, Corps, USFWS, and CDFG will be contacted, with a Contingency Plan for their review and comment, prior to implementation.

Appendix E. contains sample annual reports for each of the components discussed in this section.

VIII. MAINTENANCE DURING MONITORING PERIOD

This Section discusses proposed maintenance of the proposed mitigation site which will occur, at a minimum, for the 5 year monitoring period. Section VI.A., "Post-Construction Activities" should be referenced for Year 1 maintenance activities.

A. Maintenance Activities

1. Maintenance of Various Engineered Features: The proposed mitigation site contains several engineered features which will require inspection and regular maintenance during the monitoring period as well as in perpetuity. These include the diversion structure and diversion pipe within the FCC; the sediment trap next to the diversion; the grease and sediment separation chamber; and outlet debris rack.

A discussion will be provided with the Year 1 Annual Monitoring Summary Report, prepared on the basis of the experience of inspections and maintenance of all of these features. This discussion will identify any problems with the features, as well as a suggested schedule for directing future monitorings. Responsible parties; maintenance agreements, if required; and similar issues will also be included.

2. Control of Invasive Plants: Control of invasive plants is to occur, following the first year after implementation, on an annual basis, during annual habitat monitoring events. It will be conducted by the implementation biologist.

Section VI.A."Post-Construction Activities", 4., has listed out tentatively plants which would be considered undesirable by this project. Any plant which volunteers in either of the proposed mitigation site or restoration areas, and becomes unreasonably overcompetitive, at the expense of the goals of the mitigation/restoration, will be a candidate for eradication or control. This determination is to be made by the implementation biologist.

All controls will be manual, using hand tools. Plants unresponsive to such management will require preparation of a contingency plan. Such a plan will be circulated to the Corps, USFWS, and CDFG for review and comment prior to implementation.

3. Sediment and Erosion Control; Creek Channel Stability: Each annual habitat monitoring event will include an assessment relative to the stability of the proposed mitigation site. This analysis will involve the inspection of the site, concentrating on areas with geotextile fabric treatment (creek curves); steep slopes; vicinity of rock diversion structures; intersection points between habitat and engineered features; etc..

Restoration areas will be similarly inspected, or at a frequency indicated in a specific restoration plan.

Where minor maintenance is required, it will be conducted as part of the annual monitoring event and noted in that year's Annual Monitoring Summary Report. No major problems or failures relative to erosion are expected, but this Mitigation Proposal provides an opportunity to correct such a situation if it does arise. In such a case, a plan which responds to and permanently remedies the specific erosional situation will be prepared. This plan will be sent to the Corps, USFWS, and CDFG for review and comment prior to implementation.

B. Maintenance Schedule

Each maintenance activity, except for that involving the engineered features, will occur concurrent with annual habitat monitoring events. If such a monitoring and maintenance schedule does not provide the necessary protections required by the proposed mitigation and restoration sites, then a revised schedule will be developed, together with justifications as to why and how the new schedule would work better.

A summary of that particular year's monitoring and maintenance activities will be part of the Annual Monitoring Summary Report. All schedule revisions will be provided to the Corps, USFWS, and CDFG as part of the Annual Monitoring Summary Report, as well, for their review and comment.

IX. COMPLETION OF MITIGATION AND RESTORATION

A. Notification of Completion

As part of the last year's annual monitoring event for a particular mitigation or restoration site, a summary will be provided which will relate to how the final success criteria have been met. This summary will also contain a jurisdictional delineation, prepared in accordance with the current Corps guidance, which will verify creation or restoration of the appropriate amount of jurisdictional wetlands or other waters of the U.S., as defined by the Clean Water Act.

The notification will be provided to the Corps, USFWS, and CDFG, for their review and comment.

B. Corps Confirmation

Upon submittal to the Corps, a site visit might be arranged to confirm the findings to this final report and summary. The Corps will then provide a written acknowledgement of completion of the mitigation.

X. CONTINGENCY MEASURES

A. Initiating Procedures

Any number of situations could precipitate in preparation of a Contingency Plan. These could include severe erosional problems; lack of successful seed germination or tree survival; post-implementation destruction of the mitigation site or a particular restoration area for a variety of reasons; or failure to meet a particular success criterion. In such situations, a Contingency Plan will be developed which assesses the causes for the problem or failure, with suggestions for remedies. The Plan will be provided to the Corps, USFWS, and CDFG prior to implementation, for their review and comment.

In the case of an emergency, planning and coordination with these agencies will be via telephone and/or facsimile mail.

Situations which result in preparation and implementation of a Contingency Plan may restart a specific annual success criterion. This issue will be discussed as part of any Contingency Plan.

B. Alternative Locations for Contingency Mitigation and/or Restoration

This Proposal does not include any alternative locations for mitigation and/or restoration. Rather, through the process of intense Year 1 monitoring, following implementation; thorough annual monitorings; and options to prepare and execute contingency plans, this Proposal intends to correct any design flaws at the currently identified proposed mitigation site.

Should all these attempts fail to produce satisfactory mitigation or restoration, then alternative sites will be identified, an appropriate mitigation or restoration plan will be prepared, and subsequently implemented.

C. Contingency Funding Mechanism

BART is the responsible party for providing for all contingency plan preparation and administration. Similarly, they will be responsible for funding the purchase of new contingency sites, with associated preparation of mitigation or restoration plans, implementation of such plans, and long-term monitoring and maintenance.

XI. REFERENCES

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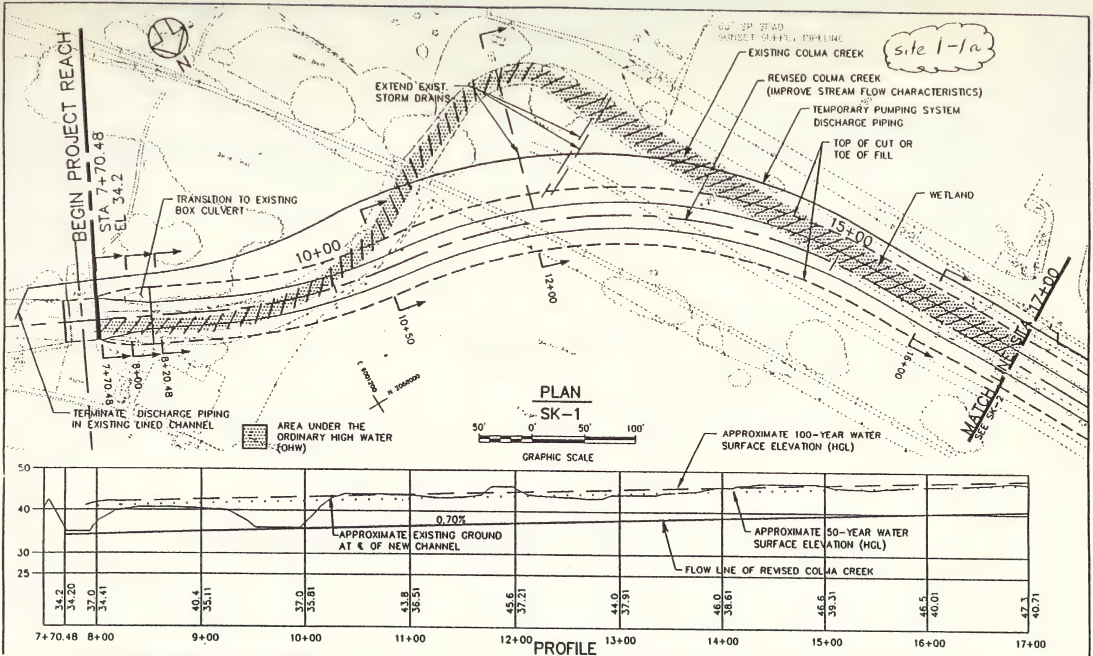
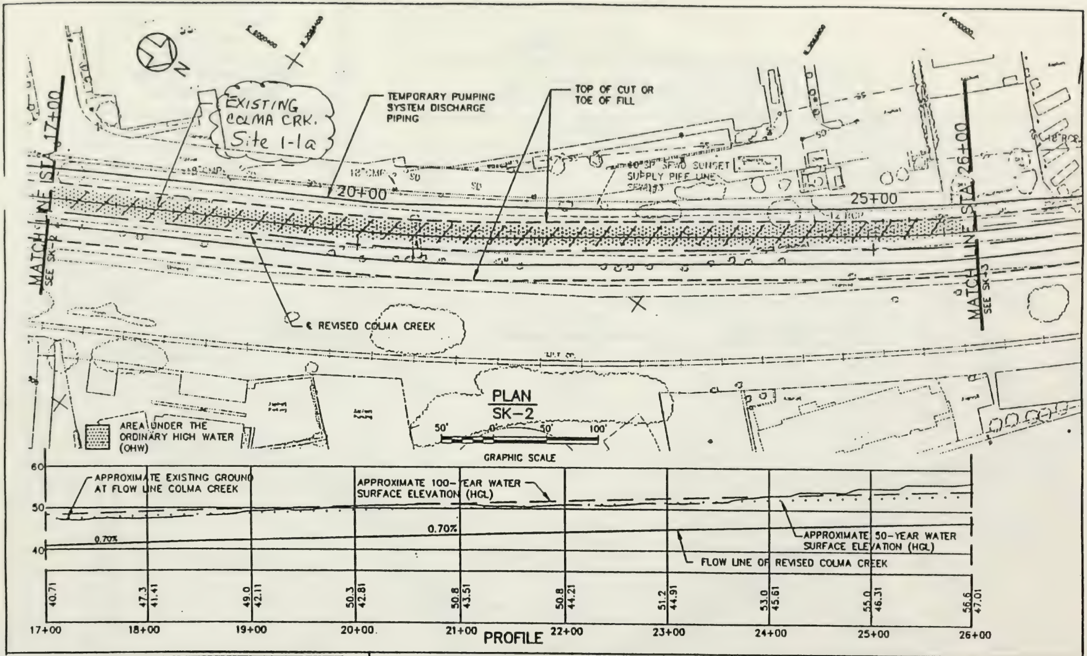

site 1-1a
BEGIN PROJECT REACH
STA 7+70.48
EL 34.2
TRANSITION TO EXISTING BOX CULVERT
EXTEND EXIST. STORM DRAINS
EXISTING COLMA CREEK
REVISED COLMA CREEK (IMPROVE STREAM FLOW CHARACTERISTICS)
TEMPORARY PUMPING SYSTEM DISCHARGE PIPING
TOP OF CUT OR TOE OF FILL
WETLAND
SUNSET SUPPLY PIPELINE
10+00
10+50
12+00
15+00
16+00
7+70.48
8+00
8+20.48
MATCH LINE STA 17+00
SEE SK-2
N
E 6001200
N 2068000
TERMINATE DISCHARGE PIPING IN EXISTING LINED CHANNEL
AREA UNDER THE ORDINARY HIGH WATER (OHW)
PLAN
SK-1
50' 0' 50' 100'
GRAPHIC SCALE
APPROXIMATE 100-YEAR WATER SURFACE ELEVATION (HGL)
APPROXIMATE EXISTING GROUND AT ℄ OF NEW CHANNEL
0.70%
APPROXIMATE 50-YEAR WATER SURFACE ELEVATION (HGL)
FLOW LINE OF REVISED COLMA CREEK
50
40
30
25
34.2
34.20
37.0
34.41
40.4
35.11
37.0
35.81
43.8
36.51
45.6
37.21
44.0
37.91
46.0
38.61
46.6
39.31
46.5
40.01
47.3
40.71
7+70.48
8+00
9+00
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
PROFILE

APPENDIX A, DRAWING 1
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Site 1-1a
Source: Sheet 6 of 74,
Corps Application

PLAN AND PROFILE

SCALE: 1"=100'H; 1"=25'V

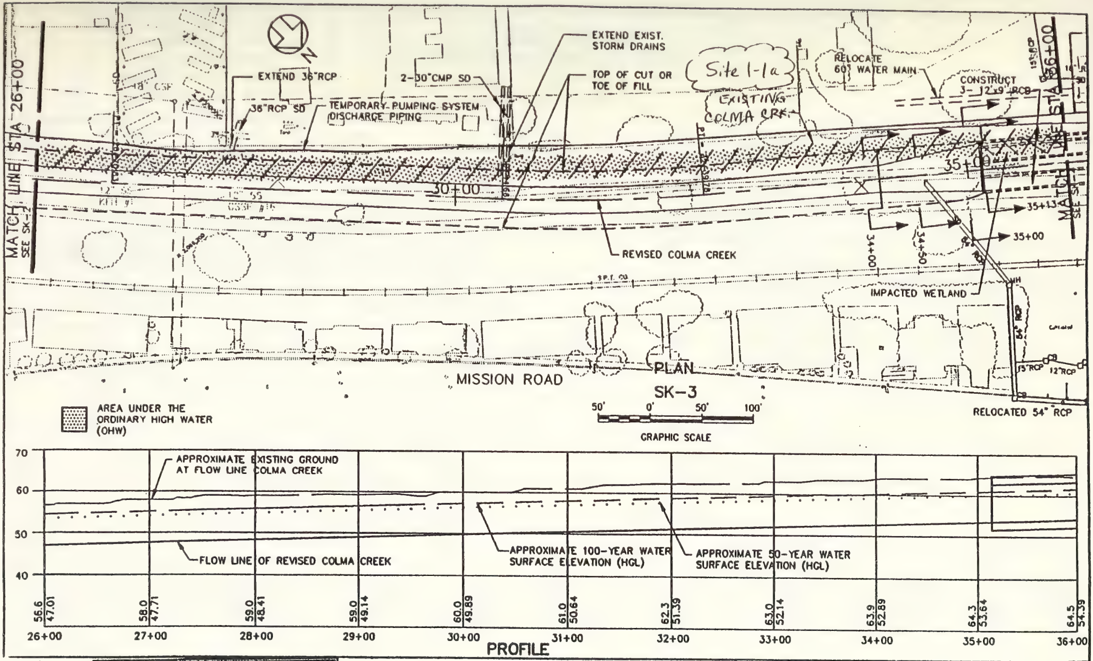
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
OAKLAND, CA 94607


MATCH LINE STA. 17+00
SEE SK-2
EXISTING COLMA CRK. Site 1-1a
TEMPORARY PUMPING SYSTEM DISCHARGE PIPING
TOP OF CUT OR TOE OF FILL
SFWD SUNSET SUPPLY PIPE LINE
18" CMP
20+00
25+00
MATCH LINE STA. 26+00
SEE SK-3
℄ REVISED COLMA CREEK
AREA UNDER THE ORDINARY HIGH WATER (OHW)
PLAN
SK-2
50'
0'
50'
100'
GRAPHIC SCALE
60
50
40
APPROXIMATE EXISTING GROUND AT FLOW LINE COLMA CREEK
APPROXIMATE 100-YEAR WATER SURFACE ELEVATION (HGL)
0.70%
0.70%
APPROXIMATE 50-YEAR WATER SURFACE ELEVATION (HGL)
FLOW LINE OF REVISED COLMA CREEK
40.71
47.3
41.41
49.0
42.11
50.3
42.81
50.8
43.51
50.8
44.21
51.2
44.91
53.0
45.61
55.0
46.31
56.6
47.01
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
25+00
26+00
PROFILE

APPENDIX A, DRAWING 2
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Site 1-1a
Source: Sheet 7 of 74,
Corps Application

PLAN AND PROFILE
SCALE: 1"=100'H; 1"=25'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
OAKLAND, CA 94607

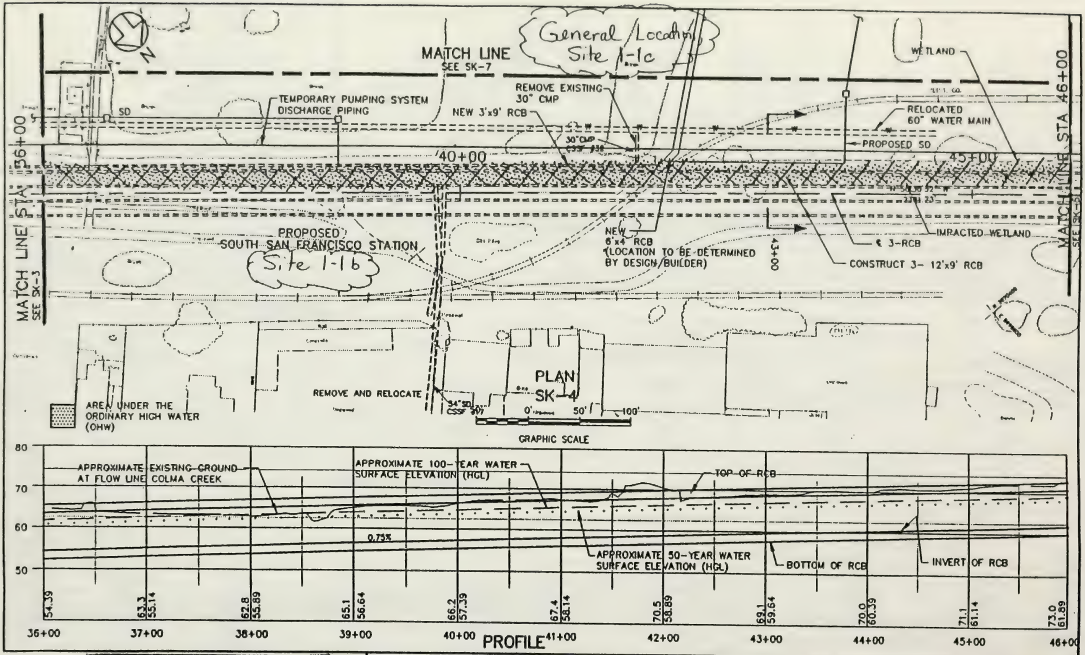


APPENDIX A, DRAWING 3
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Site 1-1a
Source: Sheet 8 of 74,
Corps Application

PLAN AND PROFILE

SCALE: 1"=100'H; 1"=25'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
OAKLAND, CA 94607

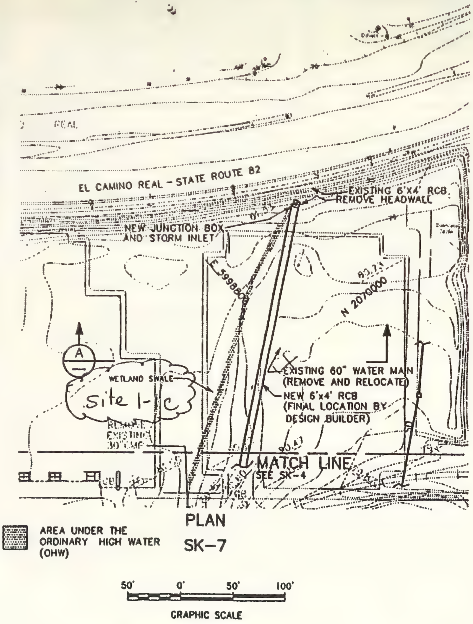


APPENDIX A, DRAWING 4
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Sites 1-1b & 1-1c
Source: Sheet 9 of 74,
Corps Application

PLAN AND PROFILE

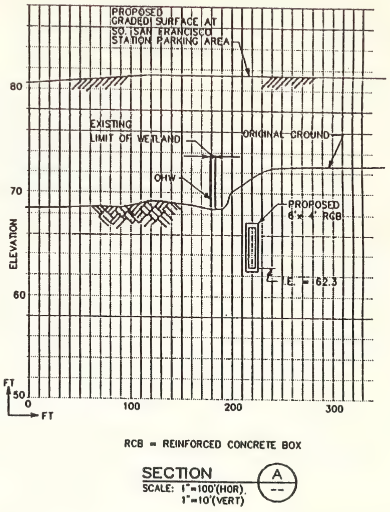
SCALE: 1"=100'H; 1"=25'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
OAKLAND, CA 94607


REAL
EL CAMINO REAL - STATE ROUTE 82
EXISTING 6'x4' RCB. REMOVE HEADWALL
NEW JUNCTION BOX AND STORM INLET
E 5998800
N 2070000
A
WETLAND SWALE
Site 1-1c
REMOVE EXISTING 30" CMP
EXISTING 60" WATER MAIN (REMOVE AND RELOCATE)
NEW 6'x4' RCB (FINAL LOCATION BY DESIGN BUILDER)
MATCH LINE (SEE SK-4)
AREA UNDER THE ORDINARY HIGH WATER (OHW)
50'
0'
50'
100'
GRAPHIC SCALE

PLAN

SK-7


PROPOSED GRADED SURFACE AT SO. SAN FRANCISCO STATION PARKING AREA
EXISTING LIMIT OF WETLAND
ORIGINAL GROUND
OHW
PROPOSED 6'x 4' RCB
I.E. = 62.3
80
70
60
50
ELEVATION
FT
0
100
200
300
FT
A
--

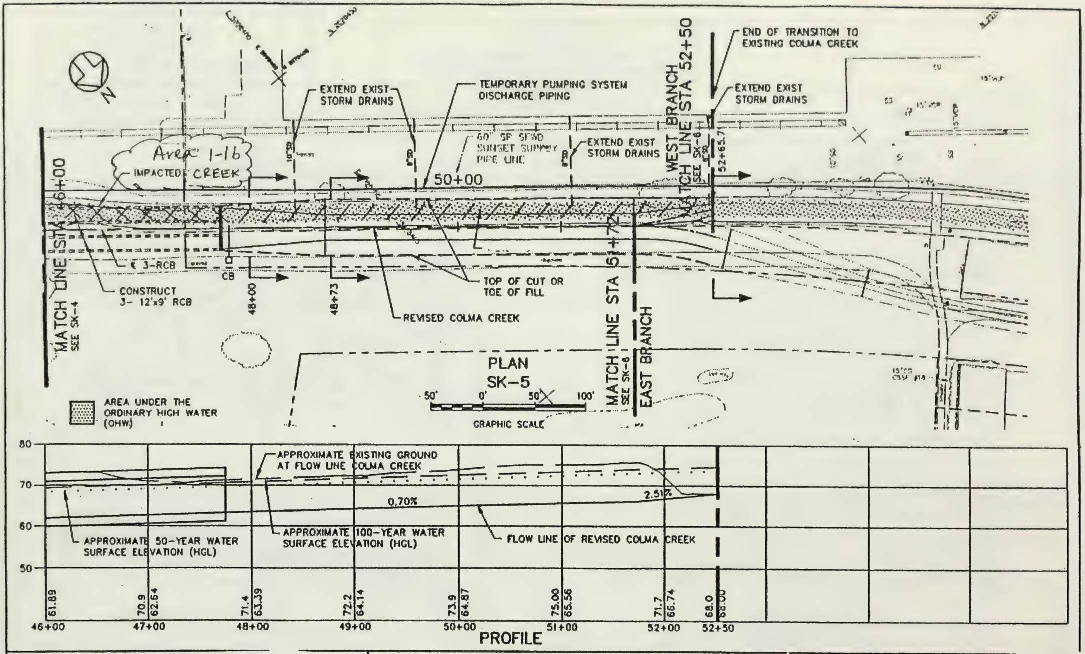
RCB = REINFORCED CONCRETE BOX

SECTION
SCALE: 1"=100'(HOR)
1"=10'(VERT)

APPENDIX A, DRAWING 5
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Site 1-1c
Source: Sheet 12 of 74,
Corps Application

PLAN AND PROFILE
SCALE: AS NOTED

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

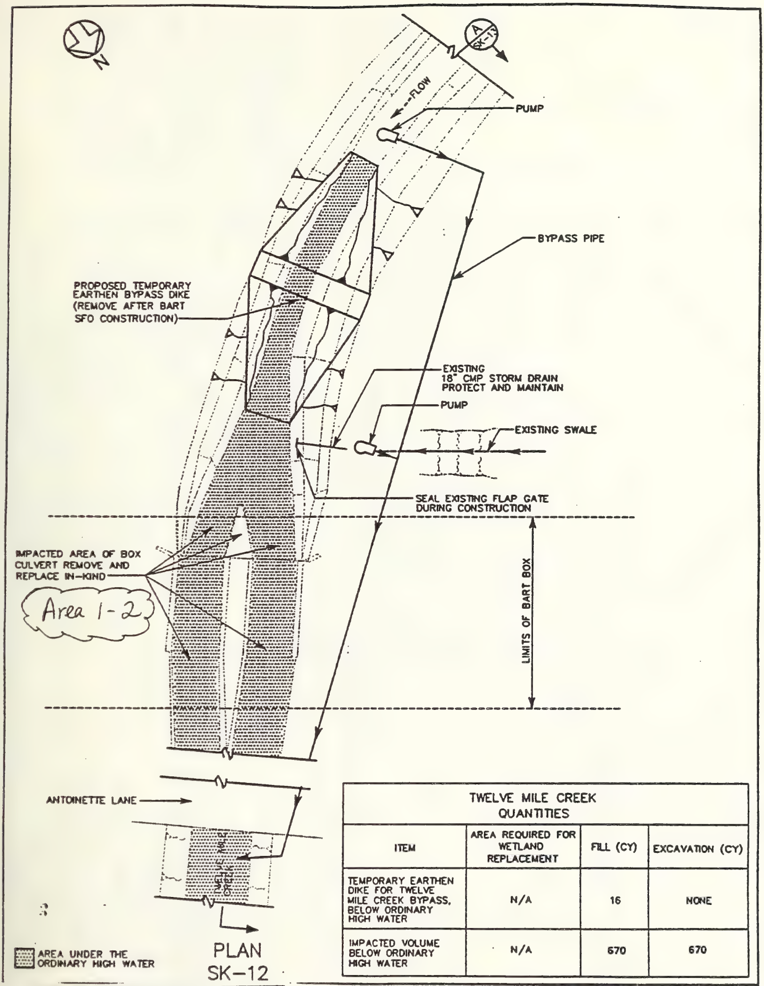

N
EXTEND EXIST STORM DRAINS
TEMPORARY PUMPING SYSTEM DISCHARGE PIPING
60" SF SFWD SUNSET SUPPLY PIPE LINE
EXTEND EXIST STORM DRAINS
WEST BRANCH
MATCH LINE STA 52+50
SEE SX-6
52+65.71
END OF TRANSITION TO EXISTING COLMA CREEK
EXTEND EXIST STORM DRAINS
Area 1-1b
IMPACTED CREEK
50+00
MATCH LINE STA 46+00
SEE SX-4
℄ 3-RCB
CONSTRUCT 3- 12'x9' RCB
CB
48+00
48+73
REVISED COLMA CREEK
TOP OF CUT OR TOE OF FILL
MATCH LINE STA 51+72
SEE SX-6
EAST BRANCH
PLAN
SK-5
50' 0' 50' 100'
GRAPHIC SCALE
AREA UNDER THE ORDINARY HIGH WATER (OHW)
80
70
60
50
APPROXIMATE EXISTING GROUND AT FLOW LINE COLMA CREEK
0.70%
2.51%
APPROXIMATE 50-YEAR WATER SURFACE ELEVATION (HGL)
APPROXIMATE 100-YEAR WATER SURFACE ELEVATION (HGL)
FLOW LINE OF REVISED COLMA CREEK
61.89
70.9
62.64
71.4
63.39
72.2
64.14
73.9
64.87
75.00
65.56
71.7
66.74
68.0
68.00
46+00
47+00
48+00
49+00
50+00
51+00
52+00
52+50
PROFILE

APPENDIX A, DRAWING 6
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Site 1-1b
Source: Sheet 10 of 74,
Corps Application

PLAN AND PROFILE

SCALE: 1"=100'H; 1"=25'V

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
OAKLAND, CA 94607

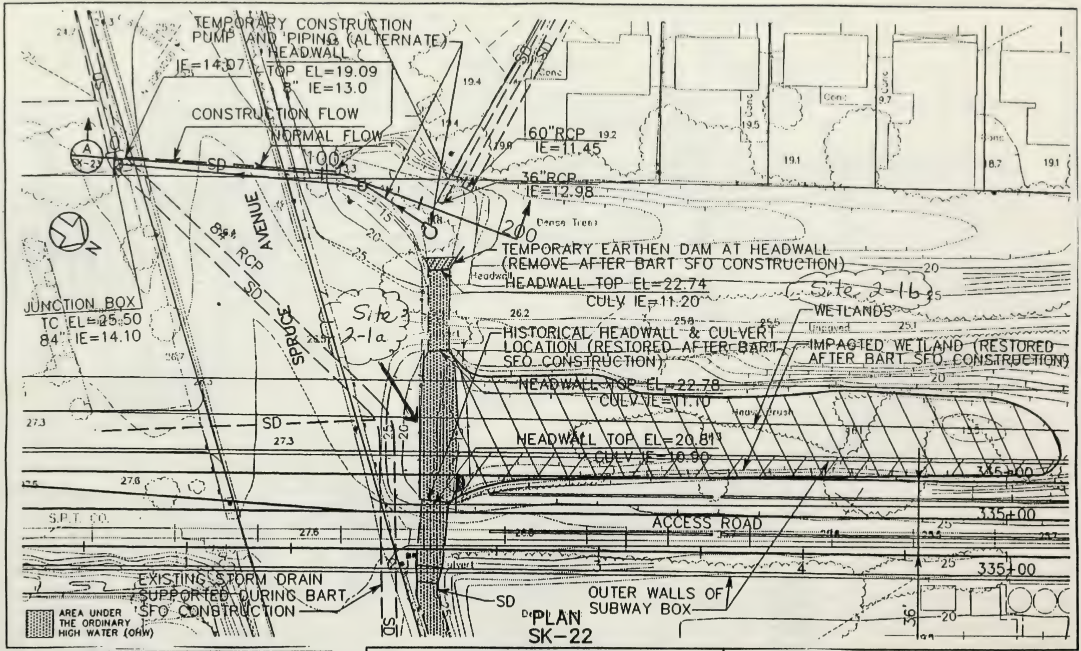

N
A
SK-13
FLOW
PUMP
BYPASS PIPE
PROPOSED TEMPORARY EARTHEN BYPASS DIKE (REMOVE AFTER BART SFO CONSTRUCTION)
EXISTING 18" CMP STORM DRAIN PROTECT AND MAINTAIN
PUMP
EXISTING SWALE
SEAL EXISTING FLAP GATE DURING CONSTRUCTION
IMPACTED AREA OF BOX CULVERT REMOVE AND REPLACE IN-KIND
Area 1-2
LIMITS OF BART BOX
ANTOINETTE LANE
TWELVE MILE CREEK
AREA UNDER THE ORDINARY HIGH WATER
PLAN
SK-12

TWELVE MILE CREEK QUANTITIES			
ITEM	AREA REQUIRED FOR WETLAND REPLACEMENT	FILL (CY)	EXCAVATION (CY)
TEMPORARY EARTHEN DIKE FOR TWELVE MILE CREEK BYPASS, BELOW ORDINARY HIGH WATER	N/A	16	NONE
IMPACTED VOLUME BELOW ORDINARY HIGH WATER	N/A	670	670

APPENDIX A, DRAWING 7
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Area 1-2
Source: Sheet 25 of 74,
Corps Application

ENLARGED VIEW
SCALE: 1"=20'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

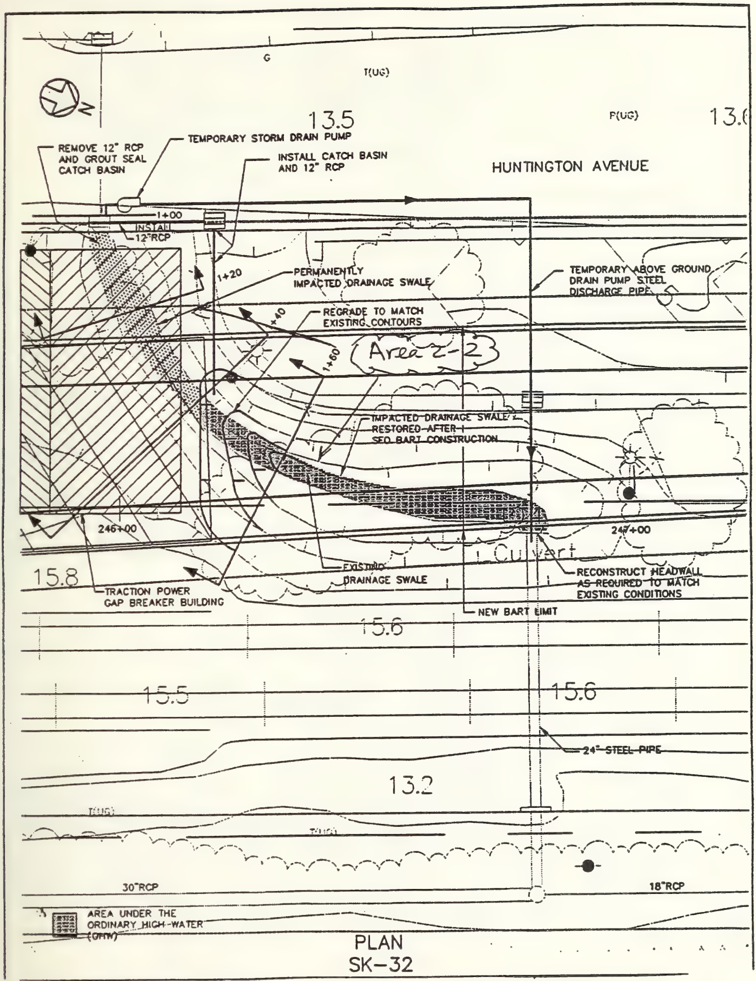

TEMPORARY CONSTRUCTION PUMP AND PIPING (ALTERNATE)
HEADWALL TOP EL=19.09
8" IE=13.0
IE=14.07
CONSTRUCTION FLOW
NORMAL FLOW
100
200
60"RCP IE=11.45
36"RCP IE=12.98
Dense Trees
A SK-23
N
84" RCP
AVENUE
SPRUCE
SD
JUNCTION BOX
TC EL=25.50
84" IE=14.10
Site 2-1a
Site 2-1b
TEMPORARY EARTHEN DAM AT HEADWALL (REMOVE AFTER BART SFO CONSTRUCTION)
HEADWALL TOP EL=22.74
CULV IE=11.20
WETLANDS
HISTORICAL HEADWALL & CULVERT LOCATION (RESTORED AFTER BART SFO CONSTRUCTION)
IMPACTED WETLAND (RESTORED AFTER BART SFO CONSTRUCTION)
HEADWALL TOP EL=22.78
CULV IE=11.10
HEADWALL TOP EL=20.81
CULV IE=10.90
Heavy Brush
335+00
ACCESS ROAD
S.P.T. CO.
EXISTING STORM DRAIN SUPPORTED DURING BART SFO CONSTRUCTION
OUTER WALLS OF SUBWAY BOX
PLAN
SK-22
AREA UNDER THE ORDINARY HIGH WATER (OHW)

APPENDIX A, DRAWING 8
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Sites 2-1a & 2-1b
Source: Sheet 38 of 74,
Corps Application

ENLARGED VIEW

SCALE: 1"=50'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

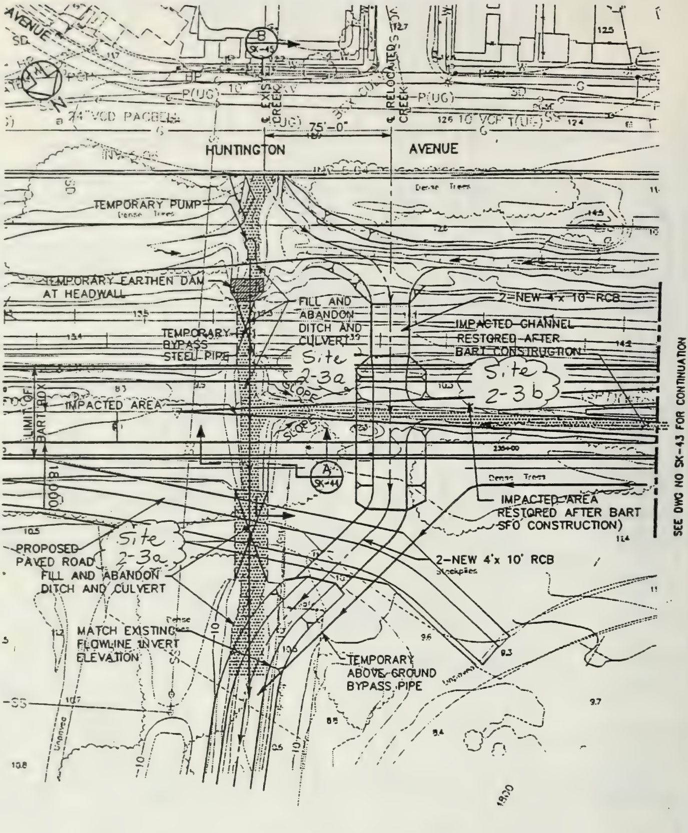

G
T(UG)
13.5
P(UG)
13.6
N
REMOVE 12" RCP AND GROUT SEAL CATCH BASIN
TEMPORARY STORM DRAIN PUMP
INSTALL CATCH BASIN AND 12" RCP
HUNTINGTON AVENUE
1+00
INSTALL 12"RCP
1+20
PERMANENTLY IMPACTED DRAINAGE SWALE
TEMPORARY ABOVE GROUND DRAIN PUMP STEEL DISCHARGE PIPE
+40
REGRADE TO MATCH EXISTING CONTOURS
1+60
Area 2-2
IMPACTED DRAINAGE SWALE RESTORED AFTER SFO BART CONSTRUCTION
246+00
247+00
Culvert
15.8
EXISTING DRAINAGE SWALE
RECONSTRUCT HEADWALL AS REQUIRED TO MATCH EXISTING CONDITIONS
TRACTION POWER GAP BREAKER BUILDING
NEW BART LIMIT
15.6
15.5
15.6
24" STEEL PIPE
13.2
T(UG)
T(UG)
30"RCP
18"RCP
AREA UNDER THE ORDINARY HIGH-WATER (OHW)

PLAN
SK-32

APPENDIX A, DRAWING 9
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Area 2-2
Source: Sheet 35 of 74,
Corps Application

ENLARGED VIEW
SCALE: 1"=20'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

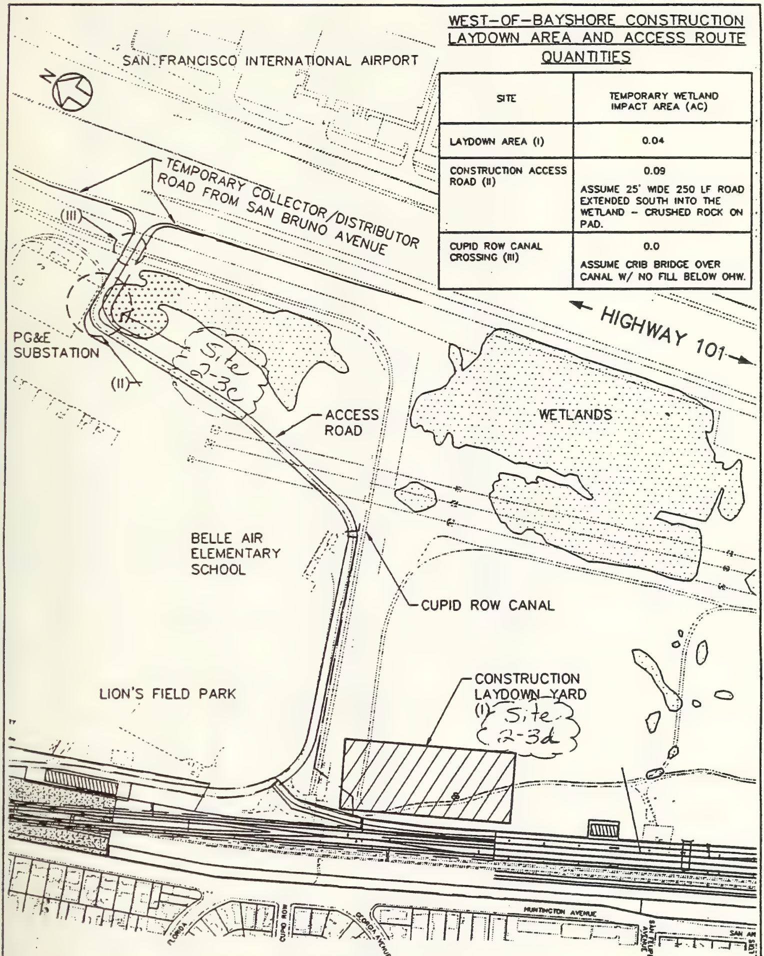

AVENUE
B
SK-45
¢ EXIST CREEK
¢ RELOCATED CREEK
P(UG)
24" VCD PACBELL
10" VCP T(UG)
75'-0"
HUNTINGTON
AVENUE
Dense Trees
TEMPORARY PUMP
TEMPORARY EARTHEN DAM AT HEADWALL
FILL AND ABANDON DITCH AND CULVERT
2-NEW 4'x 10' RCB
TEMPORARY BYPASS STEEL PIPE
IMPACTED CHANNEL RESTORED AFTER BART CONSTRUCTION
Site 2-3a
Site 2-3b
SLOPE
LIMIT OF BART BOX
IMPACTED AREA
A
SK-44
18,000
IMPACTED AREA RESTORED AFTER BART SFO CONSTRUCTION)
SEE DWG NO SK-43 FOR CONTINUATION
PROPOSED PAVED ROAD
Site 2-3a
FILL AND ABANDON DITCH AND CULVERT
2-NEW 4'x 10' RCB
Stockpiles
MATCH EXISTING FLOWLINE INVERT ELEVATION
TEMPORARY ABOVE GROUND BYPASS PIPE

PLAN
SK-42

▨ AREA UNDER THE ORDINARY HIGH WATER

APPENDIX A, DRAWING 10
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Sites 2-3a & 2-3b
Source: Sheet 40 of 74,
Corps Application

ENLARGED VIEW
SCALE: 1"=60'
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607



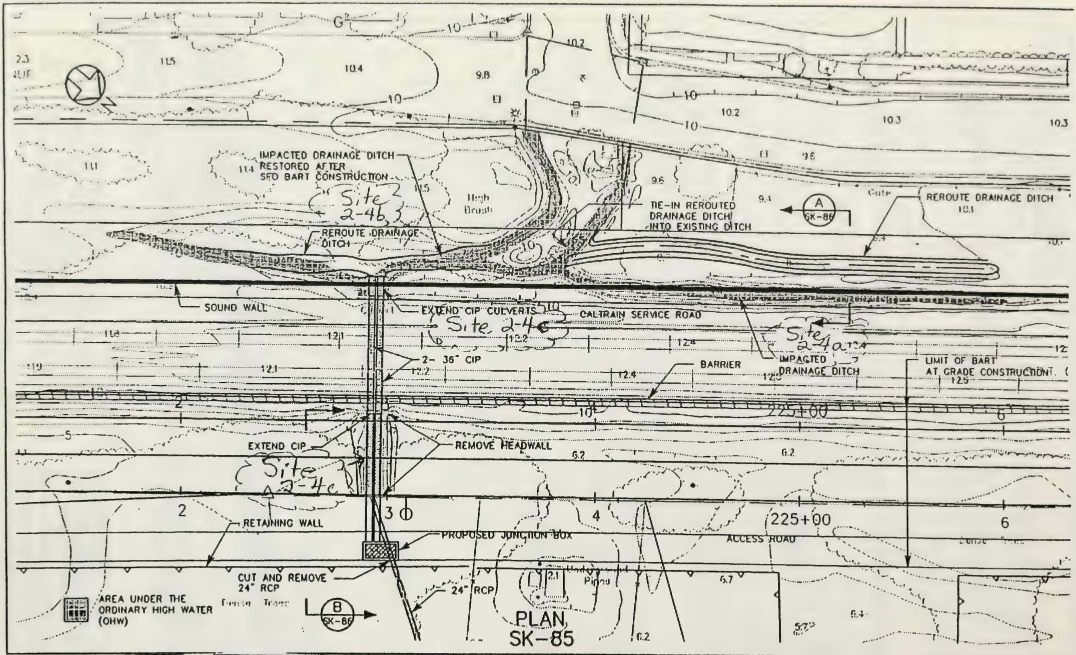
WEST-OF-BAYSHORE CONSTRUCTION LAYDOWN AREA AND ACCESS ROUTE QUANTITIES

SITE	TEMPORARY WETLAND IMPACT AREA (AC)
LAYDOWN AREA (I)	0.04
CONSTRUCTION ACCESS ROAD (II)	0.09 ASSUME 25' WIDE 250 LF ROAD EXTENDED SOUTH INTO THE WETLAND – CRUSHED ROCK ON PAD.
CUPID ROW CANAL CROSSING (III)	0.0 ASSUME CRIB BRIDGE OVER CANAL W/ NO FILL BELOW OHW.

PLAN VIEW

APPENDIX A, DRAWING 11
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Sites 2-3c & 2-3d
Source: Sheet 43A of 74,
Corps Application

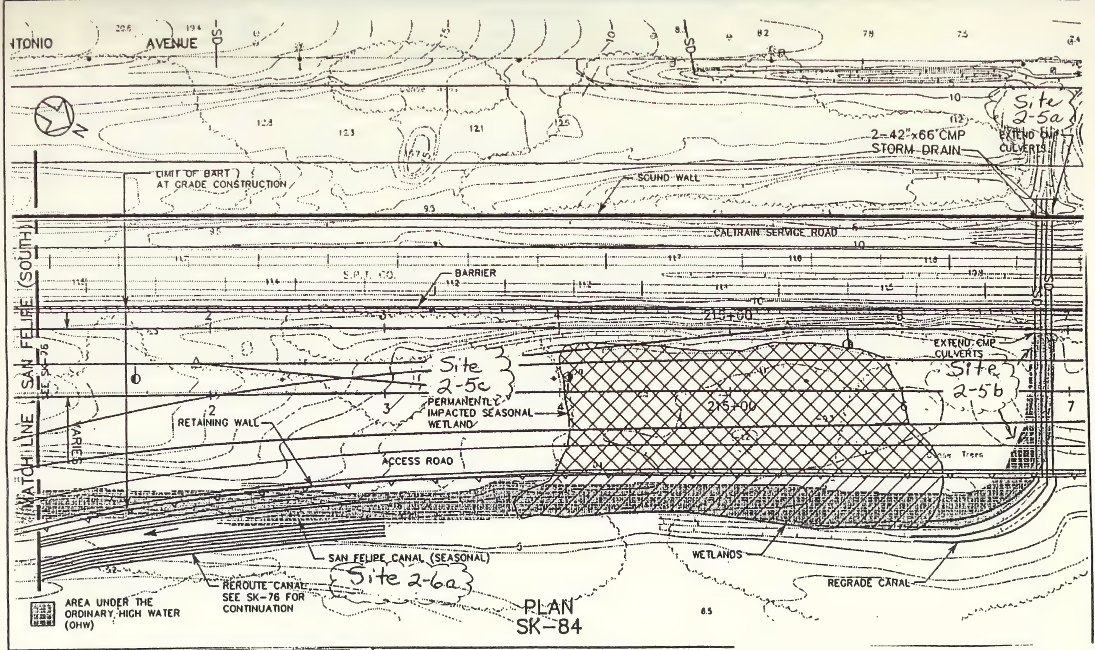
TEMPORARY LAYDOWN YARD
SCALE: 1"=300'
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607



APPENDIX A, DRAWING 12
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Sites 2-4a, 2-4b, & 2-4c
Source: Sheet 73 of 74,
Corps Application

ENLARGED VIEW
SCALE: 1"=50'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

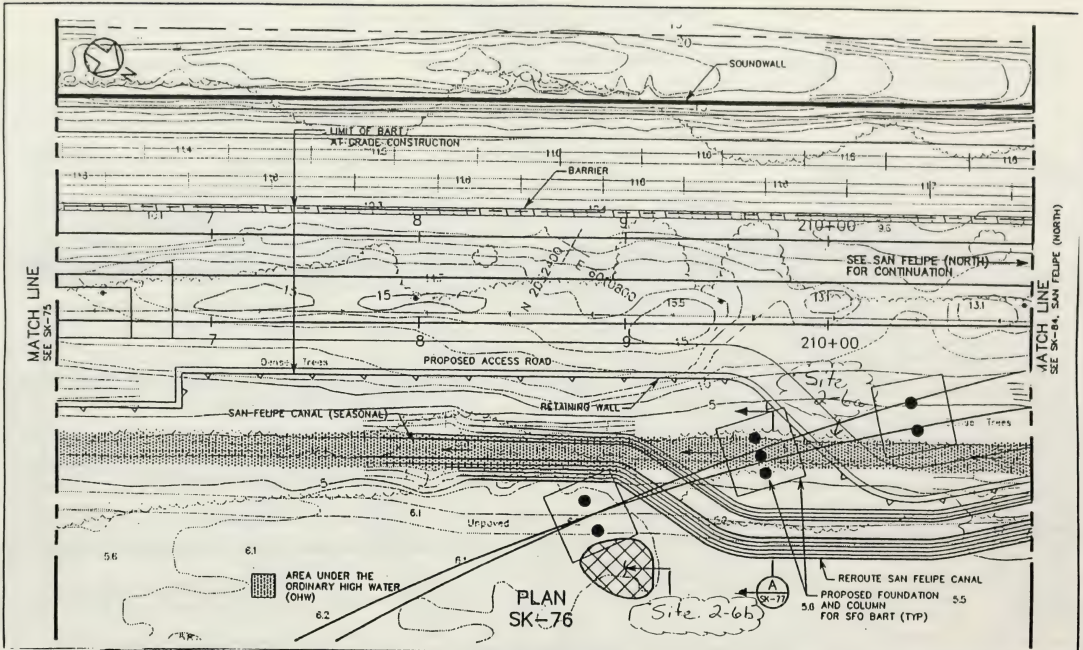

ANTONIO AVENUE
SD
Site 2-5a
EXTEND CMP CULVERTS
2-42"x66" CMP STORM DRAIN
LIMIT OF BART AT GRADE CONSTRUCTION
SOUND WALL
CALTRAIN SERVICE ROAD
S.P.T. CO.
BARRIER
215+00
EXTEND CMP CULVERTS
Site 2-5b
Site 2-5c
PERMANENTLY IMPACTED SEASONAL WETLAND
RETAINING WALL
ACCESS ROAD
VARIES
MATCH LINE SAN FELIPE (SOUTH)
SEE SK-76
SAN FELIPE CANAL (SEASONAL)
Site 2-6a
REROUTE CANAL SEE SK-76 FOR CONTINUATION
WETLANDS
REGRADE CANAL
▦ AREA UNDER THE ORDINARY HIGH WATER (OHW)
PLAN SK-84
N

APPENDIX A, DRAWING 13
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Sites 2-5a, 2-5b, 2-5c, & 2-6a
Source: Sheet 72 of 74,
Corps Application

ENLARGED VIEW

SCALE: 1"=60'

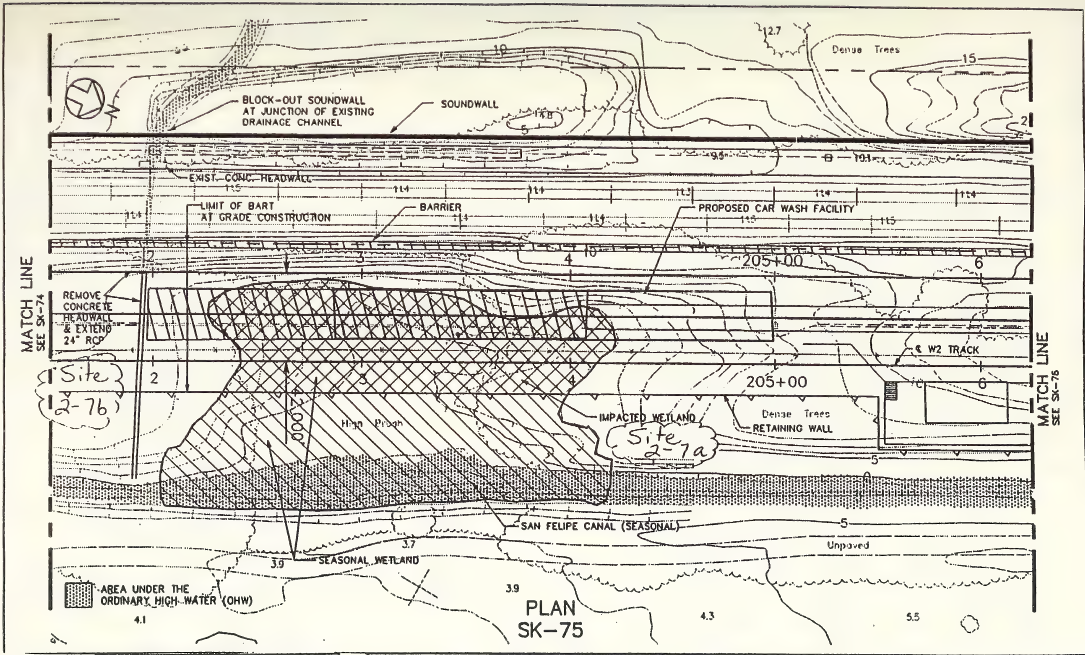
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607


MATCH LINE
SEE SK-75
SOUNDWALL
LIMIT OF BART AT GRADE CONSTRUCTION
BARRIER
210+00
SEE SAN FELIPE (NORTH) FOR CONTINUATION
MATCH LINE
SEE SK-84, SAN FELIPE (NORTH)
N 20°24'00" E
PROPOSED ACCESS ROAD
Dense Trees
RETAINING WALL
SAN FELIPE CANAL (SEASONAL)
Site 2-6a
Unpaved
AREA UNDER THE ORDINARY HIGH WATER (OHW)
PLAN
SK-76
Site 2-6b
A
SK-77
REROUTE SAN FELIPE CANAL
PROPOSED FOUNDATION AND COLUMN FOR SFO BART (TYP)

APPENDIX A, DRAWING 14
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Sites 2-6a & 2-6b
Source: Sheet 65 of 74,
Corps Application

ENLARGED VIEW
SCALE: 1"=50'

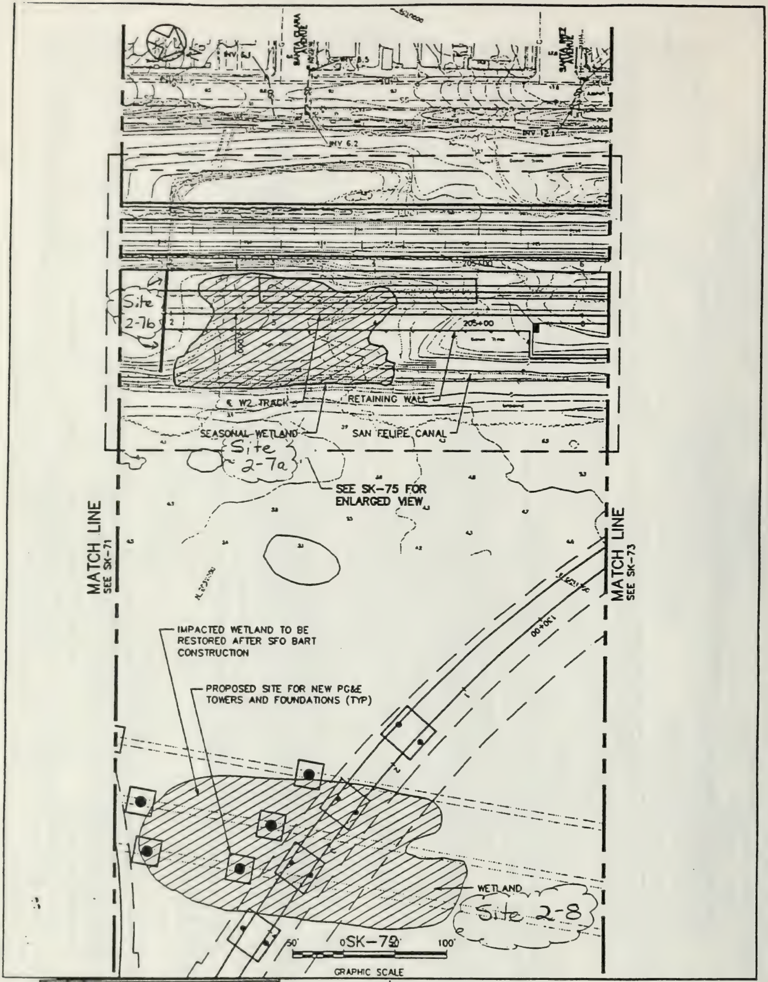
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607



APPENDIX A, DRAWING 15
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Sites 2-7a & 2-7b
Source: Sheet 64 of 74,
Corps Application

ENLARGED VIEW
SCALE: 1"=50'

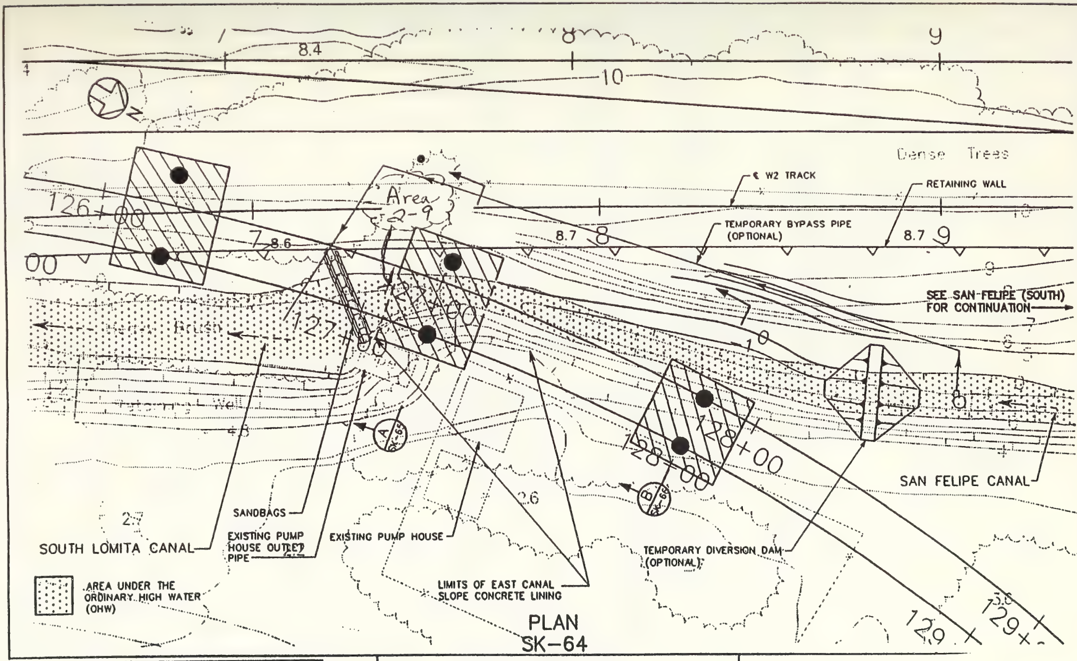
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607



APPENDIX A, DRAWING 16
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Sites 2-7a, 2-7b & 2-8
Source: Sheet 61 of 74,
Corps Application

PLAN
SCALE: 1"=100'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

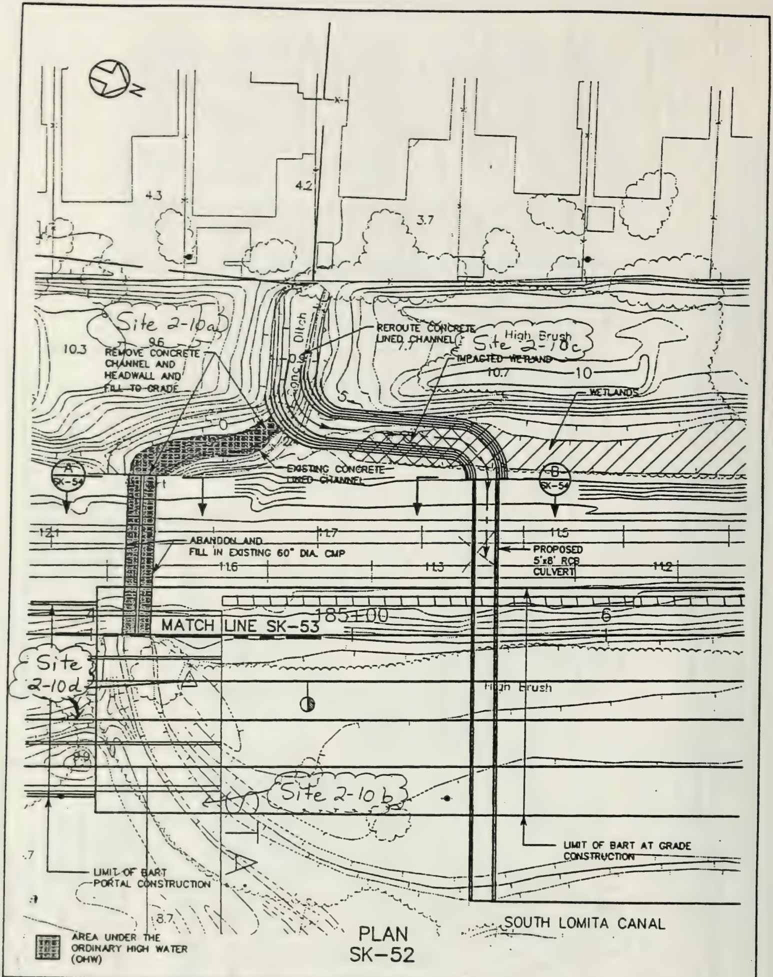


8.4
8
10
9
Dense Trees
℄ W2 TRACK
RETAINING WALL
126+00
00
7 8.6
Area 2-9
8.7 8
TEMPORARY BYPASS PIPE (OPTIONAL)
8.7 9
SEE SAN-FELIPE (SOUTH) FOR CONTINUATION
127+00
128+00
129+
129
A SK-65
B SK-66
2.7
2.6
SAN FELIPE CANAL
SANDBAGS
SOUTH LOMITA CANAL
EXISTING PUMP HOUSE OUTLET PIPE
EXISTING PUMP HOUSE
TEMPORARY DIVERSION DAM (OPTIONAL)
LIMITS OF EAST CANAL SLOPE CONCRETE LINING
AREA UNDER THE ORDINARY HIGH WATER (OHW)
PLAN
SK-64

APPENDIX A, DRAWING 17
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Area 2-9
Source: Sheet 55 of 74,
Corps Application

ENLARGED VIEW
SCALE: 1"=30'

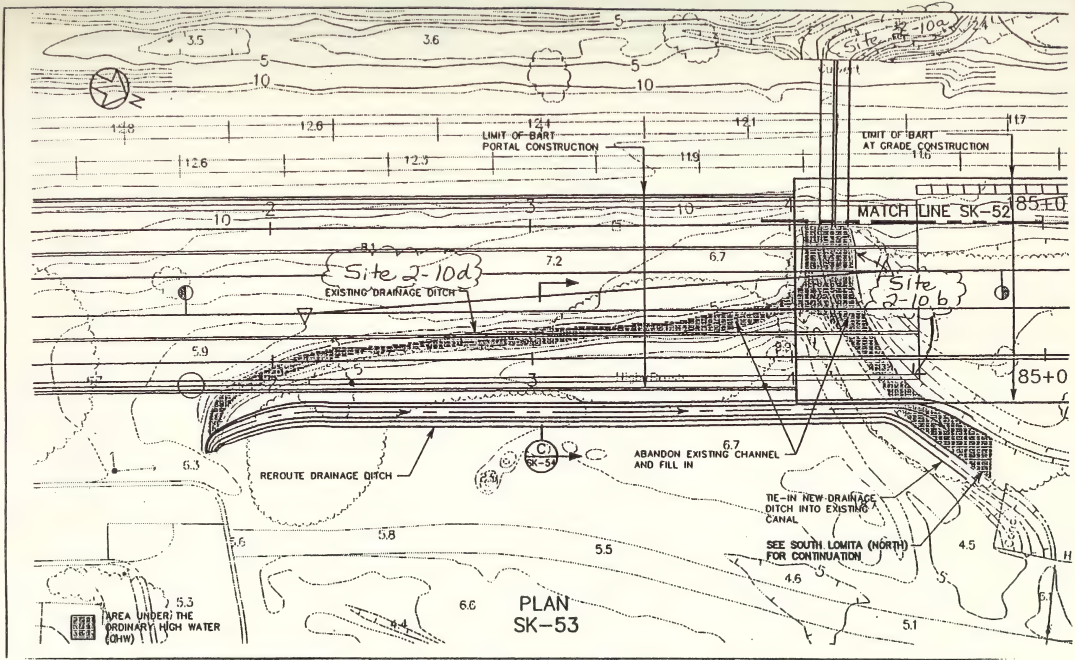
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607



4.3
4.2
3.7
Site 2-10a
9.6
10.3
REMOVE CONCRETE CHANNEL AND HEADWALL AND FILL TO GRADE
Conc. Ditch
0.9
REROUTE CONCRETE LINED CHANNEL
7.7
High Brush
Site 2-10c
IMPACTED WETLAND
10.7
10
WETLANDS
5
0
EXISTING CONCRETE LINED CHANNEL
A
SK-54
B
SK-54
12.1
11.7
11.5
ABANDON AND FILL IN EXISTING 60" DIA. CMP
11.6
11.3
PROPOSED 5'x8' RCB CULVERT
11.2
4
MATCH LINE SK-53
185+00
6
Site 2-10d
High Brush
8.9
Site 2-10 b
LIMIT OF BART AT GRADE CONSTRUCTION
.7
LIMIT OF BART PORTAL CONSTRUCTION
8.7
SOUTH LOMITA CANAL
AREA UNDER THE ORDINARY HIGH WATER (OHW)
PLAN
SK-52

APPENDIX A, DRAWING 18
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Sites 2-10a, 2-10b, 2-10c & 2-10d
Source: Sheet 47 of 74,
Corps Application

ENLARGED VIEW
SCALE: 1"=40'
BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607


Site 2-10a
Site 2-10b
Site 2-10d
EXISTING DRAINAGE DITCH
LIMIT OF BART PORTAL CONSTRUCTION
LIMIT OF BART AT GRADE CONSTRUCTION
MATCH LINE SK-52
85+0
85+0
REROUTE DRAINAGE DITCH
ABANDON EXISTING CHANNEL AND FILL IN
TIE-IN NEW DRAINAGE DITCH INTO EXISTING CANAL
SEE SOUTH LOMITA (NORTH) FOR CONTINUATION
C
SK-54
AREA UNDER THE ORDINARY HIGH WATER (OHW)
PLAN
SK-53
3.5
3.6
5
10
12.6
12.4
12.1
11.7
11.6
11.9
12.3
7.2
6.7
5.9
6.3
5.8
5.5
5.3
6.6
4.4
4.6
4.5
5.1

ENLARGED VIEW
SCALE: 1"=40'

BAY AREA RAPID TRANSIT DISTRICT
1000 BROADWAY, 4TH FLOOR
P.O. BOX 58
OAKLAND, CA 94607

APPENDIX A, DRAWING 19
PROPOSED BART-SFO PROJECT
JURISDICTIONAL AREAS
Sites 2-10a, 2-10b, & 2-10d
Source: Sheet 48 of 74,
Corps Application

SAN FRANCISCO
BAY AREA RAPID TRANSIT DISTRICT

Proposed Airport Extension

HYDRAULIC AND HYDROLOGIC ANALYSIS FOR DESIGN OF THE WETLANDS MITIGATION AREA

BAY AREA TRANSIT CONSULTANTS
MARCH, 1996

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3.0 Hydrology for Colma Creek..2

4.0 Soil Characteristics..3

5.0 Hydrology for Wetlands Area..4

  5.1 Establishment of Proposed Mitigation Site..4
  5.2 Conveyance System..5
  5.3 Hydrology of Inflows..6
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Appendix: Drill Logs and Sieve Analysis of Samples from Boreholes

List of Figures

Figure 1. Location Map

Figure 2. Vicinity Map

Figure 3. Layout of Wetlands Channel

Figure 4. Location of Soil Borings, Proposed Mitigation Site

Figure 5. Location of Soil Borings, Proposed Mitigation Site (continued)

Figure 6. Location of Diversion from Colma Creek

Figure 7. Conceptual Layout of Diversion from Colma Creek

Figure 8. Grease Removal Chamber (Typical)

Figure 9. Stilling Well and Inlet to Proposed Wetlands Channel

Figure 10. Outlet Structure for Proposed Wetlands Channel

Figure 11. Typical Wetlands Channel Cross-section

Figure 12. Typical Drop Structure, Section

HYDRAULIC AND HYDROLOGIC ANALYSIS FOR DESIGN OF THE WETLANDS MITIGATION AREA PROPOSED AIRPORT EXTENSION

1.0 INTRODUCTION

The San Francisco Bay Area Rapid Transit District (BART) proposes to establish a wetlands mitigation area as part of an overall plan for mitigating the impacts of the proposed alignment of the trackway for extension of the existing passenger rail system from the BART Colma Station to a station in the vicinity of Millbrae Avenue in Millbrae. The project is located on the San Francisco Peninsula in San Mateo County, California, as shown on Figure 1. The wetlands mitigation area for the entire extension project is evaluated in this report.

The alignment for the proposed mitigation site parallels Colma Creek for a distance of about one mile. Colma Creek is a major drainage channel which drains approximately the first half of the extension, and also drains the proposed mitigation site. The general location of the proposed wetlands mitigation site is indicated on the Vicinity Map, Figure 2.

A hydraulic and hydrologic assessment of this site was undertaken to:

1. Provide a hydraulic design of the conveyance piping and channels necessary to establish the proposed wetlands area

2. Review the hydrology of Colma Creek and establish estimated flows for determination of depth of flooding, estimated duration of inundation in the proposed wetlands area and calculation of peak flows for design of the wetlands channel and the inlet and outlet structures.

3. Provide preliminary design of a channel through the proposed wetlands area that will meet criteria for channel stability and creation of wetland habitat

4. Recommend appropriate inlet and outlet structures for the areas that will accommodate the range of flows expected in the system.

2.0 SITE DESCRIPTION

The proposed mitigation site is shown in more detail on Figure 3, and is located on the left bank of the new Colma Creek flood control channel between the Colma Creek Channel and the property along Mission Road. It slopes generally from northwest to southeast parallel to the slope of Colma Creek and contains approximately 3.5 acres. A layout of the proposed waterway through the site is shown on Figure 3.

The proposed mitigation site shown on Figures 2 and 3 will be a created wetland. Colma Creek channel will be improved to convey the 100-year flood through the BART Project area, and will not flow through the proposed mitigation site. Sufficient flow to maintain the wetland will be diverted from Colma Creek upstream from the proposed South San Francisco Station and transported to the site via a pipe that will discharge into the proposed mitigation site. An assessment of the hydrology of Colma Creek is therefore necessary to establish the flow characteristics and degree of flooding possible in the proposed mitigation area.

3.0 HYDROLOGY FOR COLMA CREEK

Colma Creek drains approximately 16 square miles within the cities of Daly City, San Bruno, and South San Francisco. The creek parallels the BART alignment for about one mile as shown on Figure 2. The proposed South San Francisco Station is located about midway through this reach. Colma Creek will be conveyed under the proposed South San Francisco Station in a culvert, which will transition into an improved, concrete-lined channel. This new Colma Creek Channel will convey Colma Creek from the proposed South San Francisco Station through the BART area and join with the existing channel at the bridge near Antoinette Lane. The BART channel improvement has the same hydraulic capacity as the existing flood control channel downstream from the bridge near Antoinette Lane.

There are two tributaries to Colma Creek located within the reach paralleling the BART alignment. The first is the Hickey Branch, which joins Colma Creek just downstream from the Treasure Island Trailer Park and is located at the upper end of this reach. The drainage area upstream from the proposed South San Francisco Station is 6.04 square miles (Corps of Engineers, 1970a) at a location just downstream from the confluence with the Hickey Branch. Another tributary, called the Evergreen Drive Tributary, is now contained within culverts, and joins Colma Creek downstream from the proposed South San Francisco Station. The drainage area above the confluence with the Evergreen Tributary is 6.43 square miles. These drainage areas are important since they are used to adjust the existing hydrologic data from the Colma Creek gauging station where the drainage area is 10.8 square miles to the point at which the diversion will be made for the proposed wetlands areas.

A gauging station was installed on the left bank of Colma Creek at Orange Memorial Park in 1962. The data obtained in the first year was not very useful because of the intakes becoming plugged with sediment. The period of record available is from October of 1963 to September of 1994, and includes both the mean daily flows and the major peak discharges in Colma Creek. A frequency analysis was made of the peak flow data to establish a flood frequency curve. As will be pointed out later, the flood peaks on Colma Creek do not significantly influence the flows to the proposed mitigation site because of the restricted capacity of the culvert conveying the flows from the diversion point to the proposed mitigation area.

The most important data are the mean daily flows, which can be used to ascertain the duration of flooding for the overbank areas along the proposed mitigation channels. These data also show that Colma Creek does not dry up during the dry season. There is flow in the creek all year round. The reason for the flow during the dry season is that there is runoff from the irrigation of the cemetery and golf course areas upstream from the proposed South San Francisco Station. These irrigation return flows will thus ensure a year-round water supply for the proposed mitigation site and greatly enhance the mitigation effort.

Before evaluating the hydraulics and hydrology for the site, the soil characteristics must first be reviewed briefly to determine whether the soils in the area will support wetlands vegetation.

4.0 Soil Characteristics

A detailed description of the soil characteristics in the vicinity of the proposed wetlands mitigation areas may be found in the Final Geotechnical Engineering Report, Segment No. 1 August, 1995 (BATC, 1995). Thirty seven borings were drilled along the alignment with grain size distribution analyses performed for 116 soil samples. Figures 4 and 5 show the location of borings B-23 through B-26 which were taken in the vicinity of the proposed mitigation site. Size distributions from samples collected from these boring are shown in Appendix A.

Generally, there are three soil types present along the alignment. These three types are:

1. An artificial fill which results from grading and leveling operations for the existing Southern Pacific Transportation Company (SPTCo) railbed and adjacent facilities. This material consists primarily of medium dense sand, silty sand, and sandy gravel. At some locations, the artificial fill contains rubble and debris, including golf balls from the driving range.

2. A Quaternary Alluvium, consisting of channel and flood plain deposits from Colma Creek. This material is primarily loose to medium dense sand, silty sand, clayey sand, sandy silt and lean sandy clay.

3. The Colma Formation Sand, consisting of very dense sand, silty sand, and clayey sand.

The borehole information shown in Appendix A indicates that the material near the surface in Boreholes B-23 to B-26 consists of the artificial fill and the Quaternary Alluvium. Some of the artificial fill along the existing SPTCo rail bed which presently passes thorough the proposed mitigation area will undoubtedly have to be removed, because it contains debris and ruble. It will be replaced either with material graded from other parts of the proposed mitigation area, or with material obtained from the excavation for the BART subway.

Testing of the Quaternary Alluvium, as indicated by the borehole and size distributions presented in Appendix A, show that the average water content is about 24%. The average fines, defined as material passing the No. 200 sieve, is about 30%, which indicates a low permeability. This means that the material can be used to establish and maintain a low-flow channel through the proposed mitigation site. It will not be necessary to augment the existing soils with fines to prevent excessive seepage. A typical d_{50} size for the material that will be in the proposed mitigation area is 0.1 mm.

The soils in the proposed wetlands mitigation site are highly variable, since they are composed of flood plain deposits from Colma Creek. It is thus impossible to provide an exact determination of capillary rise in these soils. Based on the soil samples and size distribution, however, it would appear that a capillary rise of at least one foot is a reasonable value for use in the design of the proposed wetlands area. This capillary rise will aid in the creation of saturated conditions that will promote the growth of wetlands vegetation.

There is no question that the material present along Colma Creek and in the proposed mitigation area will support wetlands vegetation following removal of the artificial fill. For example, a low area along the existing SPTCo tracks south of the proposed mitigation site already support small willow thickets and other wetland species. Willows may also be found along Colma Creek in this area even though the existing channel is concrete-lined. There are also some low areas along the SPTCo alignment near the proposed South San Francisco Station location that support cattails and other wetlands species. As is typical with many semi-arid areas, a soil with these characteristics will support wetland vegetation as long as there is a supply of water.

5.0 HYDRAULICS AND HYDROLOGY FOR WETLANDS AREA

5.1 Establishment of Proposed Mitigation Site

The proposed wetlands mitigation site will be created by diverting flows from Colma Creek at a point just upstream from the culvert under the proposed South San Francisco Station and transporting these flows to the proposed mitigation site in a pipe. The pipe will then discharge the flows into an open channel which will be constructed within the site. Runoff from the proposed mitigation site will be returned to Colma Creek. Practically all of the flow which is conveyed in Colma Creek during the dry season will be diverted into the proposed wetland area. Although diverting all of the flow during the dry season will significantly reduce the flow in the concrete-lined flood control channel immediately downstream from the culvert under the proposed South San Francisco Station, this will have no detrimental environmental impacts on the Colma Creek channel itself because the entire reach affected by the diversion is completely lined with concrete. Colma Creek will therefore be a concrete-lined flood control channel throughout the entire reach from the diversion point to the point where flows from the wetland area is returned to Colma Creek. In addition, there is some runoff from areas between the diversion point and the point at which the flow is returned to Colma Creek, so in reality, the channel will not be completely dry.

5.2 Conveyance System

Water for the proposed mitigation site will be diverted from Colma Creek upstream from the culvert under the proposed South San Francisco Station. The diversion point is located just downstream of the junction of Colma Creek with the proposed flood control channel from Mission Road, as shown on Figure 6 at Station 51+50. The elevation of the invert of the Colma Creek channel at the point of diversion is at approximately El. 65.6. The elevation of the ground at the proposed mitigation site where the flow from the diversion pipe will enter the wetlands channel is at about El. 55. There is sufficient difference in elevation that the flow can be conveyed by gravity from the diversion point to the site in a PVC or HDPE pipe culvert. This concept means that it will not be necessary to excavate the proposed mitigation site to provide enough head to supply water to the proposed mitigation site by gravity from Colma Creek; only a relatively minor regrading of the site will be necessary. A rough estimate indicates that less than 10,000 cubic yards would have to be moved.

The inlet will be constructed with a grating across Colma Creek to act as a trash rack similar to a conventional curb and gutter inlet for street inlets. In this case, standard floor grating may be used. There will also be a sediment trap at the inlet from Colma Creek to prevent transport of material to the site. A conceptual layout for the inlet from Colma Creek is shown on Figure 7. We do not anticipate significant sediment loads in Colma Creek because the present channel for Colma Creek is concrete-lined well upstream from the diversion point. However, there may be some flood flow conditions that could present sediment problems, as evidenced by some deposits observed at the confluence of the Hickey Branch with Colma Creek. For this reason, we believe that a simple sediment trap should be incorporated into the diversion works. This trap will have to be checked, and cleaned if necessary, on a regular basis during the wet season, until operating experience shows how frequent the cleaning is actually required. Some consideration will have to be given to the design of the inlet to promote sediment exclusion.

The flow at the downstream end of the pipe will first pass into a sediment and grease removal chamber, a typical example of which is shown on Figure 8. From the grease removal facility, the flow then passes into a stilling well which is shown on Figure 9. The stilling well has an overflow weir that will distribute inflows into the proposed wetlands mitigation channel at a velocity compatible with the transport capacity of the channel. This means that the inflows will not be concentrated by the pipe culvert, and that potential erosion of the wetlands channel will be prevented. It will be necessary to riprap the outlet of this structure for about 2 feet, but this structure and any riprap protection will be located outside the boundary of the proposed wetlands area. Some Enkamat ® erosion control matting will also be used in the channel bottom for another 6 feet to ensure that no erosion takes place.

The flow from the proposed mitigation site will be discharged back into Colma Creek through an outlet structure. A conceptual layout for the outlet structure is shown on Figure 10. The structure is equipped with a safety grating. The outlet pipe has been sized with a much greater capacity than the inlet to prevent backing flow up into the proposed wetland areas, and to allow for some direct runoff from rainfall on the wetland area itself.

5.3 Hydrology of the Inflows

The flow data available for Colma Creek at the gauging station located in Orange Memorial Park shows that there is some flow in Colma Creek year-round. Consequently, we anticipate that there will be flow into the proposed wetlands area year-round as well. The drainage area at the gauging station is 10.8 square miles in comparison with about 6.2 square miles at the point of diversion to the wetlands areas. Most of the dry season flows are runoff from irrigation of golf courses and cemeteries in the basin above the diversion point.

According to the flow records, the mean monthly flows for June and July in a dry year such as 1977 were about 0.62 and 0.64 cfs respectively, as measured at the gauging station. In a wet year such as 1986, the mean monthly flows in June and July were 1.30 and 1.18 cfs. The data indicate that in an average year, there is an average low flow of at least 0.5 cfs available at the diversion point for water supply to the wetlands area during the dry season. The estimated flow of 0.5 cfs at the location of the diversion to the proposed wetlands area is less than the flows recorded at the gauging station because the diversion point is located upstream from the gauging station. Since the drainage area at the point of diversion is smaller than the drainage area at the gauging station, the average flow must be smaller as well.

The maximum flow available for the proposed wetlands area is governed by the capacity of the conveyance system. The maximum capacity is not governed by the flood flows in Colma Creek because the changes in head due to changes in water level in Colma Creek itself do not significantly change the maximum capacity of the pipe culvert which supplies water to the site. Hence, the maximum flow that occurs in the proposed wetlands mitigation channel is governed primarily by the size of the pipe culvert conveying the flow from the diversion point in Colma Creek to the wetlands site.

At present, we have selected a PVC or HDPE pipe size of 18 inches which provides a maximum capacity of about 7 cfs for the site. This maximum capacity was determined by the design of the conveyance channel within the proposed mitigation site.

5.4 Conveyance Channel

Channel Section and Slope. The conveyance channel in the proposed mitigation site was designed on the basis of stable channel theory outlined by the Corps of Engineers (1970b) and Schumm (1969). The channel width and slope are determined by the median particle size, d_{50}, as obtained from the soils data and the design flow rate. In this case, the median particle size corresponds to a very fine sand, which requires a low flow velocity to prevent degradation of the channel. This in turn, requires a nearly flat slope for the channel bottom.

A typical cross-section for the proposed channel is shown in Figure 11. The channel is designed for a bank-full capacity of 2 cfs with a depth of flow of 1.25 feet. The channel bottom width is 6 feet and the channel side slopes are 1 V:3 H. The computed channel bottom slope is 1.7×10^{-5}, which for all practical purposes is horizontal. When the inflow exceeds 2 cfs, the channel will overtop and the flow will flood the overbank areas. The slope of the overbank areas is 1:20, so that at an inflow of about 5 cfs, the wetlands overbank areas that are flooded extend for a total width of about 20 feet on either side of the main channel to a depth of about 0.5 feet. At 7 cfs, the depth of flooding on the overbank areas is about 0.9 feet. The velocities in the main part of the proposed channel are 0.16 ft/s at a discharge of 2 cfs, 0.21 ft/s at 5 cfs and 0.22 ft/s at 7 cfs. These velocities are deliberately kept low to preclude erosion on the site. Because the soil is relatively impermeable, it will probably take only a week or two to establish saturated conditions throughout the length of the channel.

Since the establishment of this wetlands channel will saturate soils in the area, a French drain should be installed along the entire length of the north-easterly side of the proposed site. The function of this drain is to preclude any potential problems with soils and foundation conditions in the properties between the proposed mitigation site and Mission Road. The drain should be contained in a trench about 6 feet deep, lined with geotextile, and filled with clean gravel. Standard perforated pipe can be used for the drain. The perforated pipe should then outlet into Colma Creek for proper drainage.

Based on the gauging station records for Colma Creek, the mean daily flows in the period from November through April are above 10 cfs with sufficient duration to ensure that the overbank areas are flooded for more than 30 days during this period, depending on the rainfall for the particular year. Colma Creek is a small watershed, so the duration of high flows is short. Consequently, the overbank areas in the wetlands will not be flooded for more than a few days at a time. Typically, the overbank flooding will be less than one day, which implies frequent, short-duration flooding which will not drown out vegetation. During periods of extended rainfall, the area may be flooded up to three days, but the water will recede as soon as the rain stops, because this is such a small watershed.

Channel Drops (Riffles). The natural slope in the proposed mitigation site is so steep that a series of drops will be required to maintain the wetland channel slope at 1.7×10^{-4} and ensure the stability of the channel. There is about a 15 foot drop in elevation through the proposed mitigation site. We recommend that these drops be no greater than 0.5 feet in height and be constructed using small rock to form a series of riffles along the channel. A typical cross-section for such a drop is shown on Figure 12. On a preliminary basis, there will be about 29 drops within the site.

The use of drops to maintain a stable channel is a common technique for control of erosion in channel design (Corps of Engineers, 1970b). The drop structures proposed for the mitigation site will stabilize the channel slope, and prevent degradation of the channel. In essence, these drop structures check any tendency for erosion of the channel. In addition to stabilizing the channel, we recommend that the drops also be used to form locally wider areas within the wetlands area through which the channel will flow. These locally wider areas along the channel, as indicated on Figure 3, will provide additional wetlands areas to support wetlands vegetation.

It is important that native grasses be established in the channel and along the overbank areas as soon as possible after construction. The use of a geotextile to assist in establishing the vegetation should be considered in the final design of this wetland site. Grass and vegetation is an excellent means of erosion control, and will serve to stabilize the channel and overbank areas and help prevent erosion during periods of overbank flows during the wet season.

Channel Bends. Channel bends present another area that requires special attention for erosion control. The shear stresses, which are responsible for eroding the channel bed, are two to three times higher in channel bends than in straight sections of the channel. We therefore recommend that the channel bends be reinforced with Enkamat®, which is a geotextile that has been used successfully in the design of grass-lining for flood control channels. The vegetation grows through and is rooted in the geotextile, which significantly increases the resistance to erosion. In addition, the vegetation hides the geotextile so that there is no visible trace when the vegetation is established.

The channel bends have been proportioned in accordance with accepted practice to reduce the shear stresses and the potential for erosion in the channel bends. The channel has therefore been laid out with minimum bottom width to bend radius ratio of W/B =2.5. The preliminary layout shown on Figures 3 satisfies this design criterion.

6.0 CONCLUSIONS AND RECOMMENDATIONS

1. Development of a created wetlands area for the BART SFO Extension Project along Colma Creek is feasible from a hydraulic and hydrologic viewpoint.

2. Colma Creek will supply water year-round to the proposed site, thus enhancing the mitigation efforts.

3. The use of a gravity-flow pipe to convey discharges diverted from Coma Creek to the proposed mitigation site limits the maximum flow in the wetlands channel and promotes a more stable channel.

4. The soils in the area are not highly permeable and will support a low flow channel through the proposed mitigation site.

5. Artificial fill used in the construction of the SPTCo railroad bed should be removed and not used in the construction of the wetlands area.

6. Channel drops will be required to control erosion and provide a riffles for habitat diversity.

7. The drops should be used to create pools downstream of the drops and wider areas upstream from the drops to increase the area of wetlands which will support additional wetlands vegetation.

8. A geotextile reinforcing (e. g. Enkamat®) will be required to stabilize the channel bends and prevent further development of the stream meanders. Geotextiles may also be required in other areas to provide stability until the vegetation has become well established.

9. A French Drain should be provided along the north-easterly side of the proposed mitigation site to prevent potential problems with soils and foundations in the properties between the site and Mission Road. The drain should discharge into Colma Creek.

7.0 REFERENCES

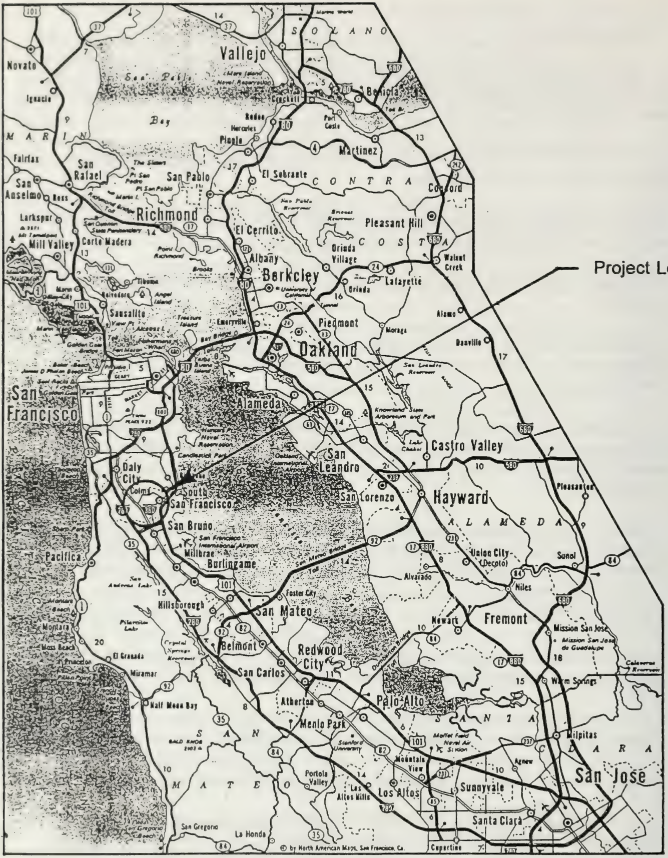
1. Bay Area Rapid Transit District (1995a), "Final Geotechnical Engineering Report, Segment No. 1," prepared by Bay Area Transit Consultants

2. Bay Area Rapid Transit District (1995b), "Geotechnical Data Report, Segment No. 1," prepared by Geotechnical Consultants Inc. for Bay Area Transit Consultants

3. Schumm, S. A. (1969) Chapter 4 in "River Mechanics", H. Shen, editor

4. U. S. Army Corps of Engineers (1970a), "Report on Standard Project Flood Determination, Colma Creek Basin, San Mateo County, California," U. S. Army Engineer District, San Francisco, CA, August 1970, revised November, 1970

5. U. S. Army Corps of Engineers, (1970b) Engineer Manual EM 1110-2-1601, "Hydraulic Design of Flood Control Channels"



Project Location

FIGURE 1. LOCATION MAP

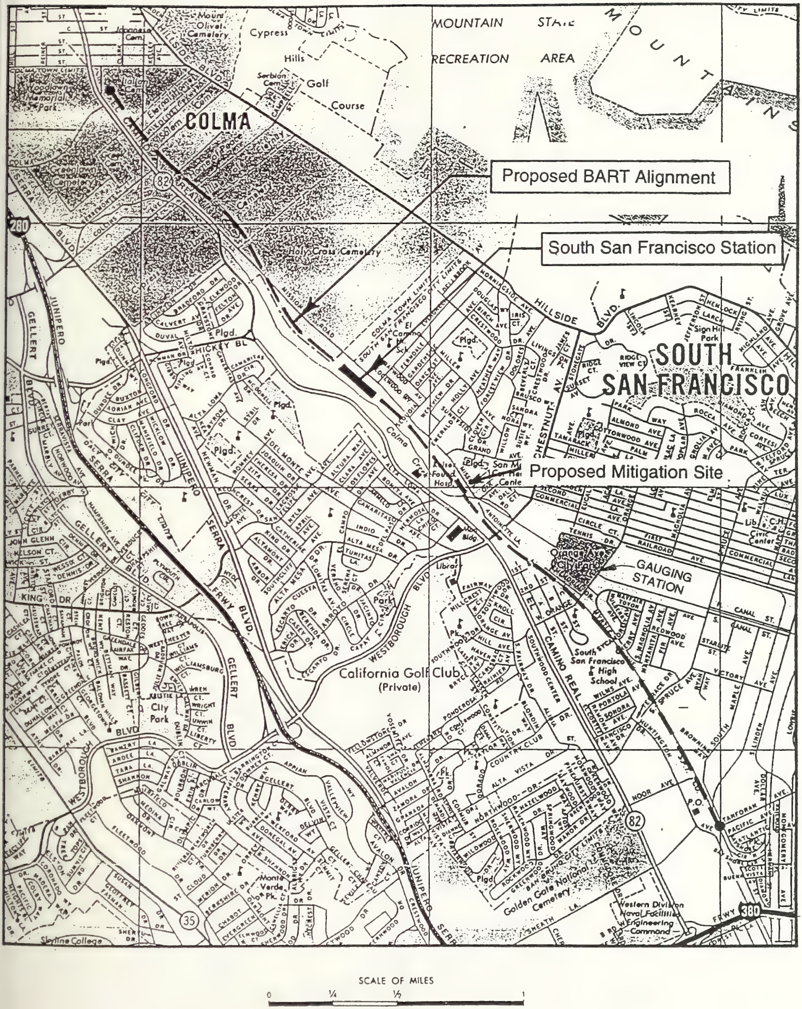


FIGURE 2. VICINITY MAP

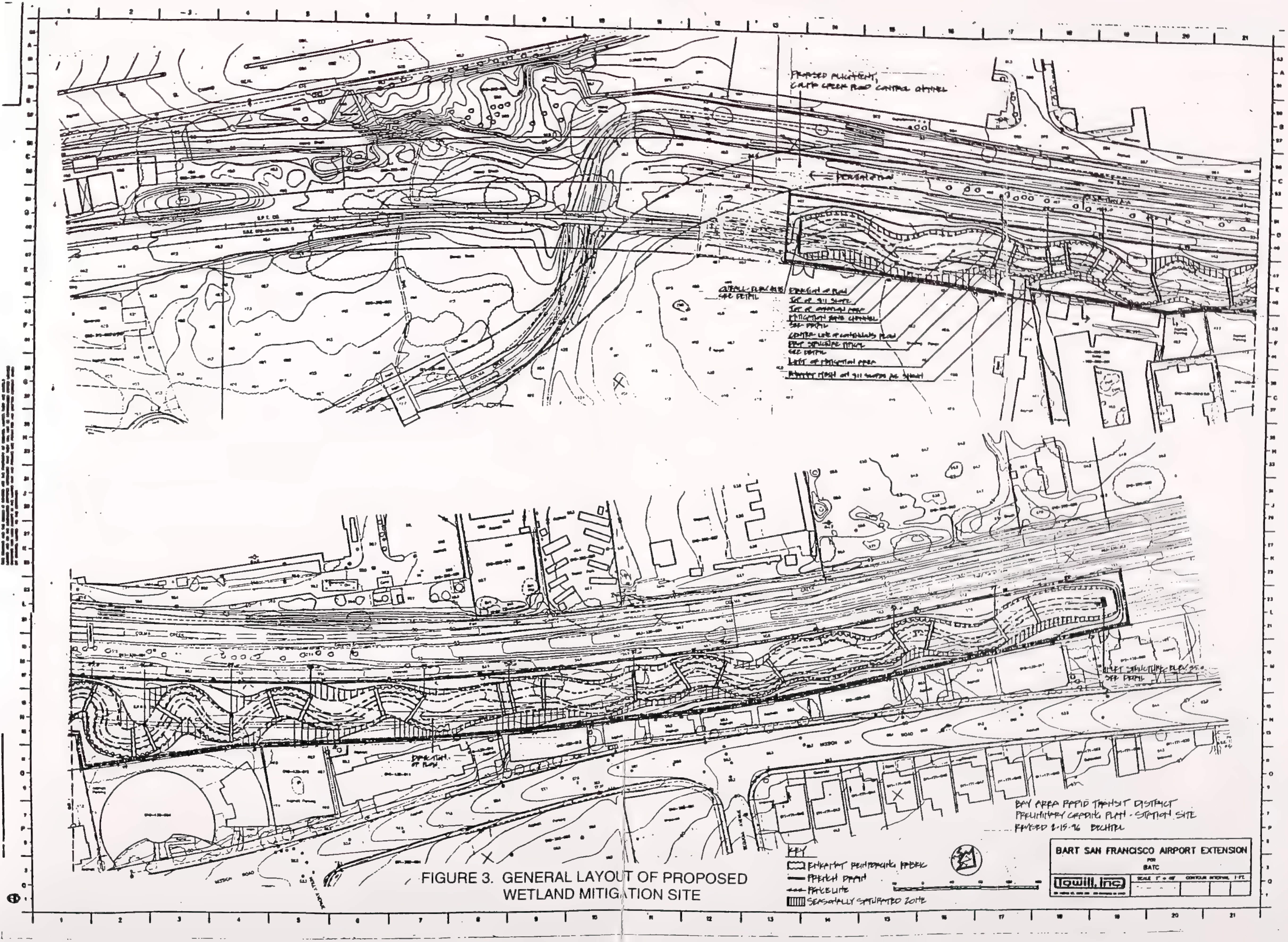


FIGURE 3. GENERAL LAYOUT OF PROPOSED WETLAND MITIGATION SITE

NOTE

1. FOR NOTES AND LEGEND SEE DRAWING G201

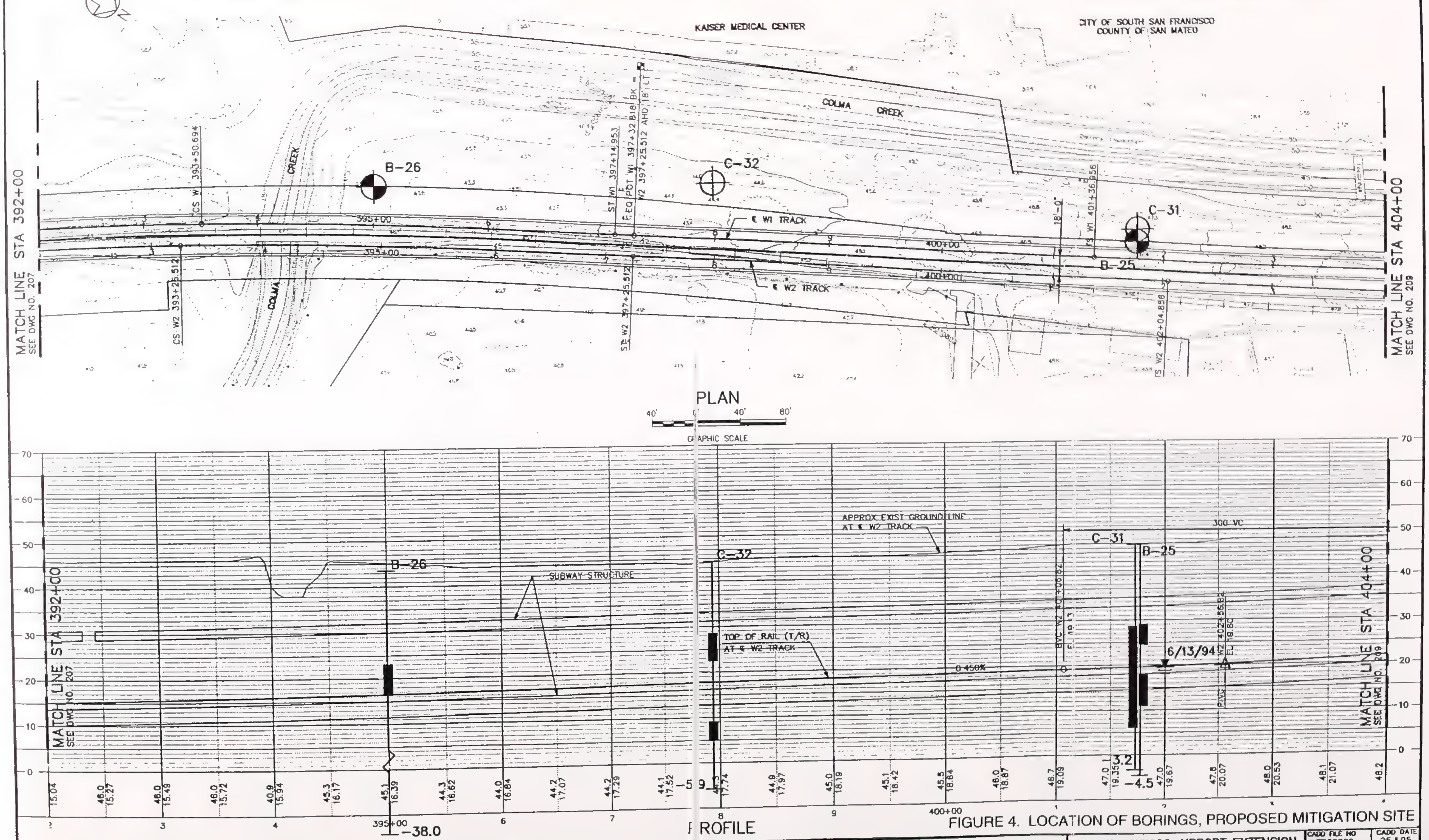


FIGURE 4. LOCATION OF BORINGS, PROPOSED MITIGATION SITE

DESIGNED BY
DRAWN BY
CHECKED BY
IN CHARGE
DATE

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
SUBMITTED

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
APPROVED

SAN FRANCISCO AIRPORT EXTENSION

GEOTECHNICAL INVESTIGATIONS
W2 392+00 TO W2 404+00

CADD FILE NO WEB0G208	CADD DATE 25JL95
SCALE 1"=40'H; 1"=10'V	
CONTRACT NUMBER	ACTIVITY CODE
DWG NO G208	REV 0
	PAGE NO

NOTE
1. FOR NOTES AND LEGEND SEE DRAWING G201.

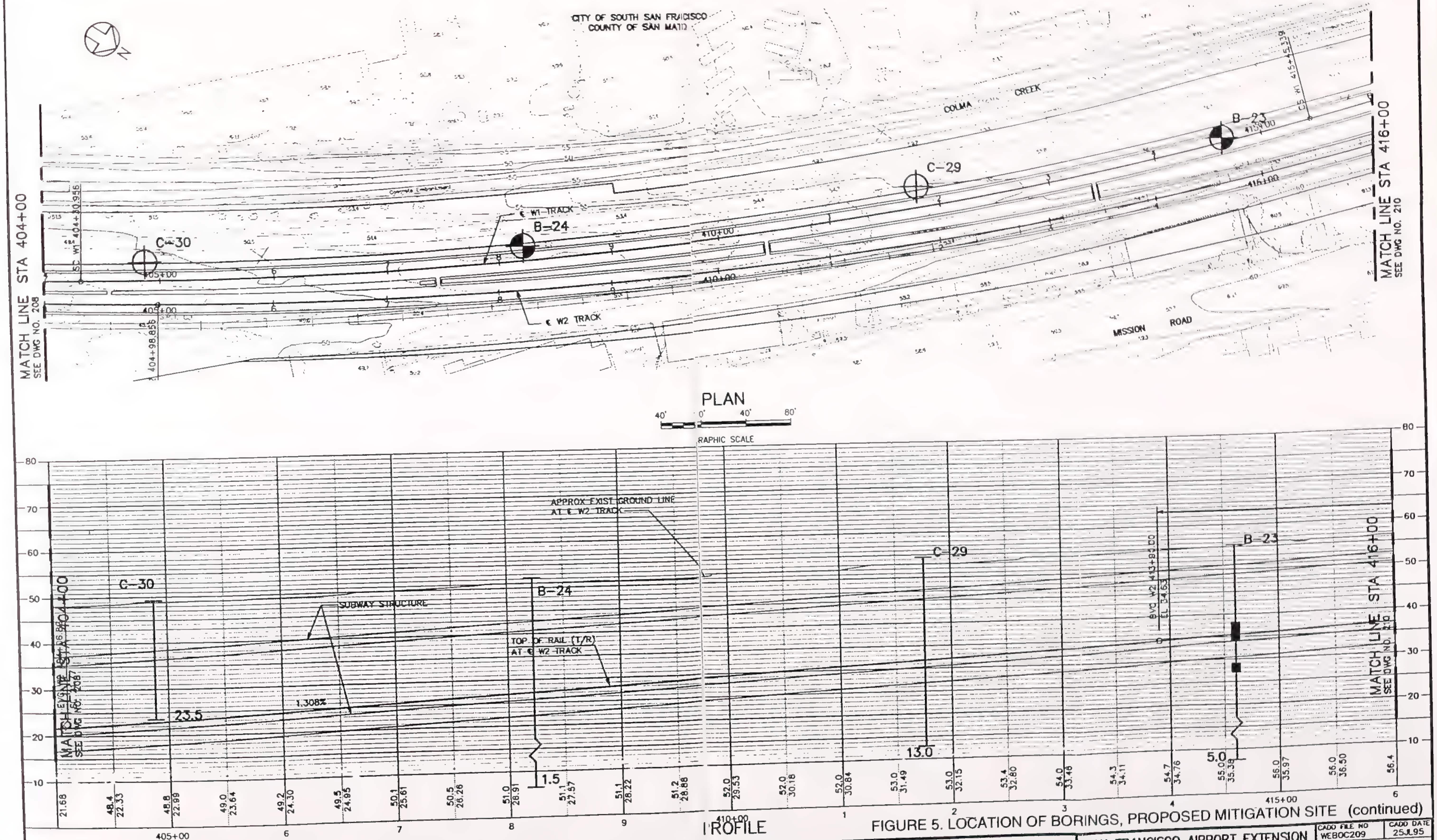


FIGURE 5. LOCATION OF BORINGS, PROPOSED MITIGATION SITE (continued)

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
SUBMITTED

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
APPROVED

SAN FRANCISCO AIRPORT EXTENSION

PLAN AND PROFILE
W2 404+00 TO W2 416+00

CADD FILE NO	CADD DATE
WEBOC209	25JL95
SCALE 1"=40'H; 1"=10'V	
CONTRACT NUMBER	ACTIVITY CODE
DWG NO C209	REV 0

DESIGNED BY
DRAWN BY
CHECKED BY
IN CHARGE
DATE

REV	DATE	BY	SUB	APP	DESCRIPTION
0					ALIGNMENT APPROVAL

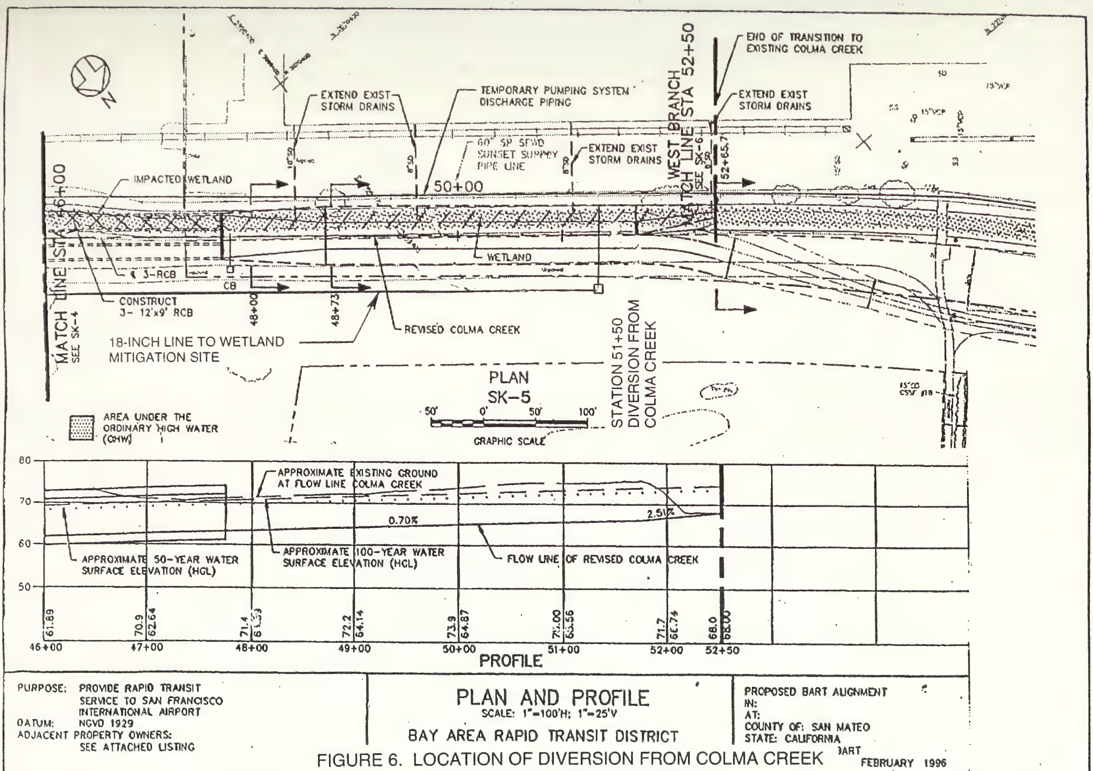

EXTEND EXIST STORM DRAINS
TEMPORARY PUMPING SYSTEM DISCHARGE PIPING
60" SP SFWD SUNSET SUPPLY PIPE LINE
EXTEND EXIST STORM DRAINS
WEST BRANCH
MATCH LINE STA 52+50
SEE SK-6
52+65.7
END OF TRANSITION TO EXISTING COLMA CREEK
EXTEND EXIST STORM DRAINS
IMPACTED WETLAND
50+00
MATCH LINE STA 46+00
SEE SK-4
℄ 3-RCB
CB
CONSTRUCT 3- 12'x9' RCB
48+00
48+73
WETLAND
REVISED COLMA CREEK
18-INCH LINE TO WETLAND MITIGATION SITE
STATION 51+50 DIVERSION FROM COLMA CREEK
PLAN
SK-5
50' 0' 50' 100'
GRAPHIC SCALE
AREA UNDER THE ORDINARY HIGH WATER (OHW)
80
70
60
50
APPROXIMATE EXISTING GROUND AT FLOW LINE COLMA CREEK
0.70%
2.51%
APPROXIMATE 50-YEAR WATER SURFACE ELEVATION (HGL)
APPROXIMATE 100-YEAR WATER SURFACE ELEVATION (HGL)
FLOW LINE OF REVISED COLMA CREEK
61.89
70.9
62.64
71.4
63.53
72.2
64.14
73.9
64.87
73.00
63.56
71.7
66.74
68.0
68.00
46+00
47+00
48+00
49+00
50+00
51+00
52+00
52+50
PROFILE
PURPOSE: PROVIDE RAPID TRANSIT SERVICE TO SAN FRANCISCO INTERNATIONAL AIRPORT
DATUM: NGVD 1929
ADJACENT PROPERTY OWNERS: SEE ATTACHED LISTING
PLAN AND PROFILE
SCALE: 1"=100'H; 1"=25'V
BAY AREA RAPID TRANSIT DISTRICT
PROPOSED BART ALIGNMENT
IN:
AT:
COUNTY OF: SAN MATEO
STATE: CALIFORNIA
BART
FEBRUARY 1996

FIGURE 6. LOCATION OF DIVERSION FROM COLMA CREEK FOR WETLAND MITIGATION SITE

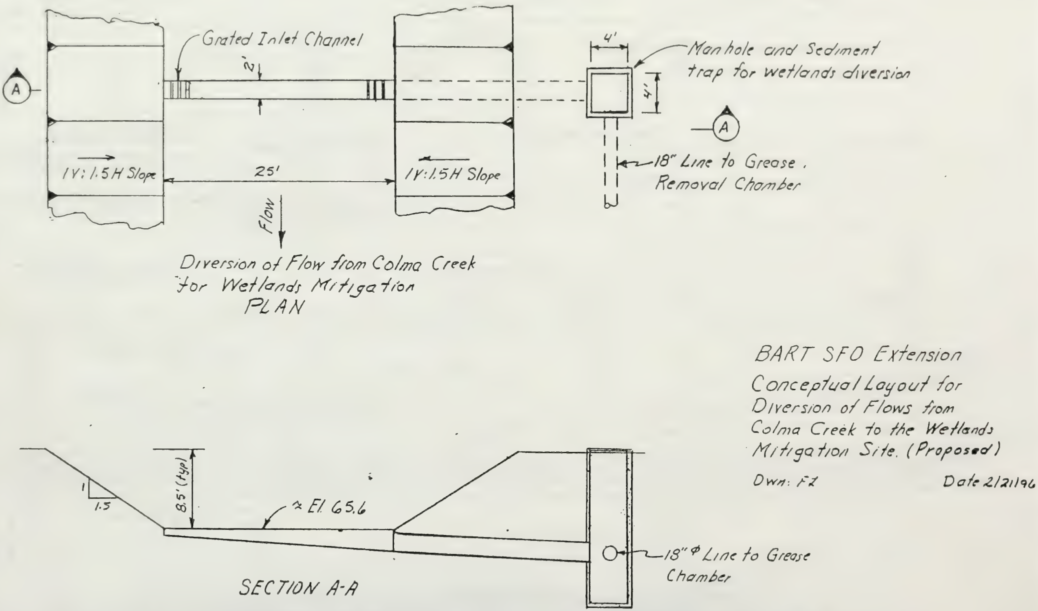
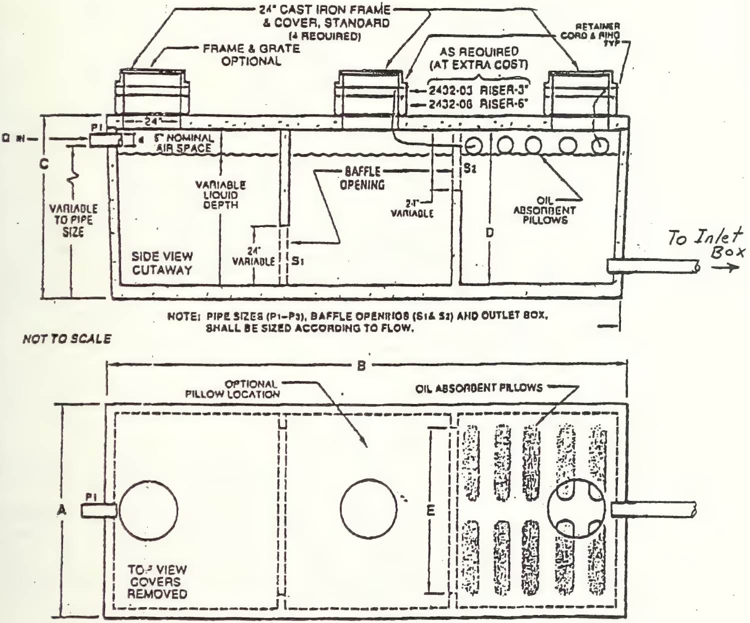

Grated Inlet Channel
2'
A
1V:1.5H Slope
25'
1V:1.5H Slope
Flow
4'
4'
Manhole and Sediment trap for wetlands diversion
A
18" Line to Grease . Removal Chamber
Diversion of Flow from Colma Creek for Wetlands Mitigation
PLAN
BART SFO Extension
Conceptual Layout for Diversion of Flows from Colma Creek to the Wetlands Mitigation Site. (Proposed)
Dwn: FZ
Date 2/21/96
1
1.5
8.5' (typ)
≈ El. 65.6
18" Φ Line to Grease Chamber
SECTION A-A

FIGURE 7. CONCEPTUAL LAYOUT OF DIVERSION FROM COLMA CREEK



SEDIMENT/OIL SEPARATOR

FIGURE 8. GREASE REMOVAL CHAMBER (TYPICAL)

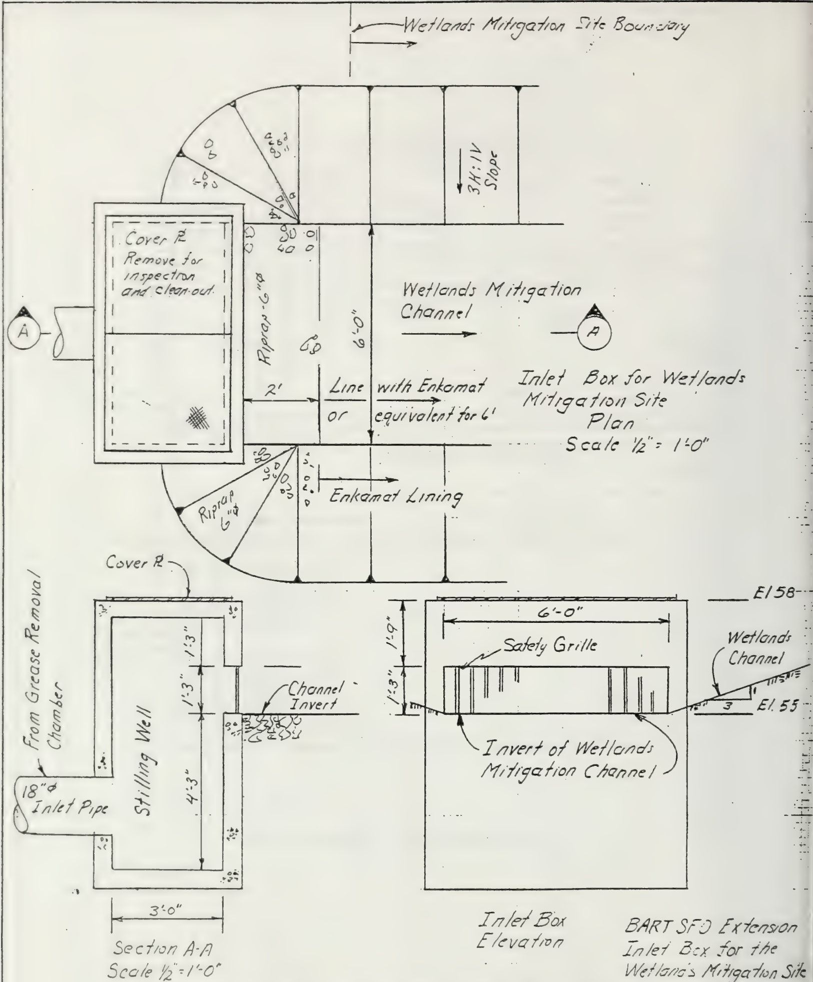


FIGURE 9. STILLING WELL AND INLET TO PROPOSED WETLANDS CHANNEL

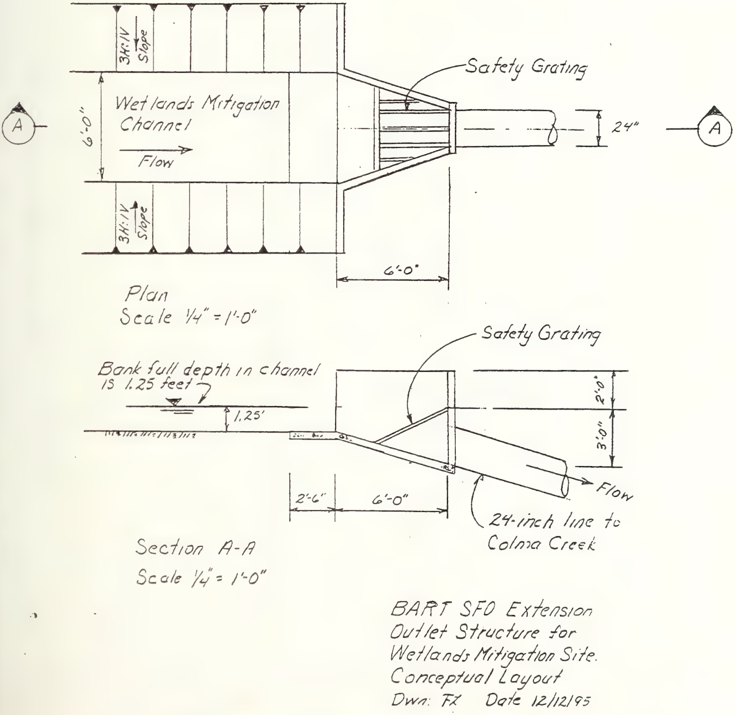


FIGURE 10. OUTLET STRUCTURE FOR PROPOSED WETLANDS CHANNEL

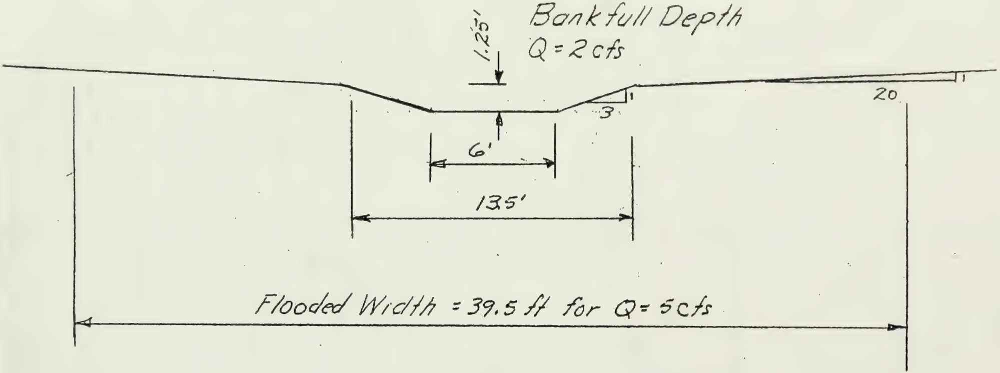


FIGURE 11. TYPICAL WETLANDS CHANNEL CROSS SECTION

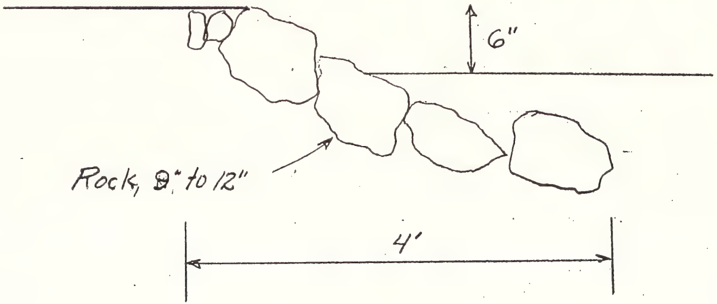


FIGURE 12. TYPICAL DROP STRUCTURE, SECTION

APPENDIX A

DRILL LOGS

AND

SIEVE ANALYSIS OF SAMPLES FROM BOREHOLES

LOG OF DRILL HOLE

JOB NO.: SF94011
PROJECT: BART SFO Airport Extension
LOCATION: Northing: 2069458.32; Easting: 5999830.91
DRILLING METHOD: 4 7/8" diameter Rotary Wash with cathead

LOGGED BY: J. Gonzalez
CHECKED BY: M. Petersen

DRILL HOLE NO.: B-23
DRILLING DATE: May 17, 1994
ELEVATION: 56.04 feet
DATUM: NGVD

DEPTH (FEET)	SAMPLE	BLOW COUNT	TORVANE SHEAR STRENGTH (PSF)	POCKET PENETROMETER COMP. STRENGTH (TSF)	PHOTOVAC TIP READING (PPM)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTIC LIMIT (%)	UNCONFINED SHEAR STRENGTH (PSF)	ADDITIONAL TESTS
							"ARTIFICIAL FILL (af)" SILTY SAND (SM) brown, damp, loose, some fine gravel, some clay locally.						
		4					Aluminum foil at 3 feet.						
							"ARTIFICIAL FILL (af)" CLAYEY SAND (SC) dark brown, moist, medium dense, fragments of burnt wood and roots, fine gravel throughout, fine to coarse sand.						
		12											
		18					Gravel at 7 feet.						
10		8		0.5			Black, moist.	107	22	28	15		
							"ALLUVIUM (Qal)" LEAN CLAY (CL) black, moist, soft, some fine grained sand.						
		7					Increasing clay.						
							"ALLUVIUM (Qal)" SILTY SAND (SM) dark blue-gray, loose, fine grained sand, 19% fines.						
20		13											GS
				0.5			"ALLUVIUM (Qal)" LEAN TO ORGANIC CLAY (CL/OL) black, moist, soft to medium stiff.		31	47	26		
		18						98	25				GS
							"ALLUVIUM (Qal)" SILTY SAND with gravel (SM) light gray-brown with orange veins, moist, fine grained sand, fine gravel, medium dense, 35% fines.	111	19				
30		82					"COLMA FORMATION (Qc)" SILTY SAND (SM) light orange-brown, with veins of dark orange, moist to wet, very dense.						
		68					"COLMA FORMATION (Qc)" SILTY SAND to CLAYEY SAND (SC/SM) light orange-brown, moist, very dense, some orange veins, weakly cemented.						
							"COLMA FORMATION (Qc)" SILTY SAND (SM) orange, moist, very dense.						
40		80/11"					With light gray-brown patches.						
		78/10"					Orange-brown, friable.						
50		77											
							Bottom of drill hole at 51 feet. Backfilled hole with soil cuttings and grouted uppermost 5 feet.						

SHEET 1 of 1

LEGEND TO LOGS ON PLATE A-1.0

PLATE A-2.23

LOG OF DRILL HOLE

JOB NO.: SF94011
PROJECT: BART SFO Airport Extension
LOCATION: Northing: 2068985.85; Easting: 6000263.81
DRILLING METHOD: 4 7/8" diameter Rotary Wash with cathead

LOGGED BY: J. Gonzalez
CHECKED BY: H. Petersen

DRILL HOLE NO.: B-24
DRILLING DATE: May 17, 1994
ELEVATION: 52.01 feet
DATUM: NGVD

DEPTH (FEET)	SAMPLE	BLOW COUNT	TORVANE SHEAR STRENGTH (PSF)	POCKET PENETROMETER COMP. STRENGTH (TSF)	PHOTOVAC TIP READING (PPM)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT (%)	ATTERBERG LIMITS PLASTIC LIMIT (%)	UNCONFINED SHEAR STRENGTH (PSF)	ADDITIONAL TESTS
							"ARTIFICIAL FILL (af)" SANDY GRAVEL (GW/GP) gray gravel with brown sand, damp, medium dense.						
							"ALLUVIUM (Qal)" SILTY SAND with gravel (SM) brown, damp, loose to medium dense.						
		18					"ALLUVIUM (Qal)" CLAYEY SAND (SC) gray-brown and orange-brown, moist, medium dense, fine grained sand, 44% fines.	102	18				GS
		10					Interbedded layers of silt (ML) and silty sand (SM) 2 to 4-inches thick at 7 feet.						
10		8					Black, loose, at 10 feet, 40% fines.						GS
		75					"COLMA FORMATION (Qc)" SILTY SAND (SM) light gray-brown with orange bands, moist, fine to medium grained sand, very dense, some roots, 14% fines.	107	17				GS
20		50					Dark orange-brown, locally weakly cemented.						
		50					Light gray-orange, wet.						
30		65					Weakly cemented.						
		21		3.25			"COLMA FORMATION (Qc)" CLAYEY SAND (SC) light gray with light orange staining, moist, medium dense, fine grained sand, 40% fines.						GS
40		56					"COLMA FORMATION (Qc)" SILTY SAND (SM) orange, moist, very dense, fine sand with dark orange staining.						
		90/10"					Medium to fine grained sand at 45 feet, some black speckles.						
							Dark orange with black speckles.						
50		50/6"											
							Bottom of drill hole at 50 1/2 feet. Backfilled hole with soil cuttings and grouted uppermost 5 feet.						

SHEET 1 of 1

LEGEND TO LOGS ON PLATE A-1.0

PLATE A-2.24

LOG OF DRILL HOLE

JOB NO.: SF94011
PROJECT: BART SFO Airport Extension
LOCATION: Northing: 2068456.27; Easting: 6000630.83
DRILLING METHOD: 4 7/8" diameter Rotary Wash with cathead

LOGGED BY: J. Gonzalez
CHECKED BY: V. Thilakaratne

DRILL HOLE NO.: B-25
DRILLING DATE: May 18, 1994
ELEVATION: 47.00 feet
DATUM: NGVD

DEPTH (FEET)	SAMPLE	BLOW COUNT	TORVANE SHEAR STRENGTH (PSF)	POCKET PENETROMETER COMP. STRENGTH (TSF)	PHOTOVAC TIP READING (PPM)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT (%)	ATTERBERG LIMITS PLASTIC LIMIT (%)	UNCONFINED SHEAR STRENGTH (PSF)	ADDITIONAL TESTS
							"ARTIFICIAL FILL (af)" SILTY SAND (SM) brown, damp, loose, with gray gravel, pile of broken concrete blocks from 6-inches to 2 feet. 2 feet: Golf ball, cobbles, rocks to 4 feet. No samples at 2 1/2 feet, concrete blocks in hole.						
		5					"ALLUVIUM (Qal)" SILTY SAND (SM) blue-gray, moist to wet, loose, fine grained sand, roots.						
10		20					"ALLUVIUM (Qal)" SILTY SAND (SM) blue-gray, moist to wet, medium dense, fine grained sand, roots, 2-inch thick layer of clayey silt (ML) at 10 1/2 feet.						
		38					Dense, black at 17 feet. 18 1/2 feet: Blue-gray.						
20		15					Medium dense.	104	20	30	12		
		11		1.5			"ALLUVIUM (Qal)" SANDY LEAN CLAY (CL) dark gray, moist, stiff, fine grained sand, green-blue and orange lenses, occasional fine gravel. 25 feet: Green-blue gray with white speckles.						
					▼								
30		21					"ALLUVIUM (Qal)" CLAYEY SAND (SC) dark gray, moist, medium dense, fine grained sand, some roots, 28% fines.	102	21				GS DS
		31		1.25			"ALLUVIUM (Qal)" SANDY LEAN CLAY (CL) gray-brown, moist, stiff, sandy/silty lenses.	98	25	31	14		C
							"ALLUVIUM (Qal)" SILTY SAND (SM) gray, moist, dense, fine grained sand, some brown veins.						
40		50/6"					"COLMA FORMATION (Qc)" POORLY GRADED SAND with silt and gravel (SP-SM) light gray, moist, very dense, medium to fine grained sand, fine gravel.						
		20											
							"COLMA FORMATION (Qc)" SILTY CLAY (CL-ML) dark brown, moist, very stiff, veins of gray sand, fine grained sand, sulfur odor, organic content 1.5%.						OR
50		33					"COLMA FORMATION (Qc)" SILTY SAND (SM) gray and gray-brown, moist, dense.						
							Bottom of drill hole at 51 1/2 feet. Groundwater measured at 27.5 feet depth on 6/13/94. Piezometer installed.						

SHEET 1 of 1

LEGEND TO LOGS ON PLATE A-1.0

PLATE A-2.25

LOG OF DRILL HOLE

B NO.: SF94011
OJECT: BART SFO Airport Extension
CATION: Northing: 2067887.80; Easting: 6000978.92
ILLING METHOD: 4 7/8" diameter Rotary Wash with cathead

LOGGED BY: J. Gonzalez
CHECKED BY: M. Petersen

DRILL HOLE NO.: B-26
DRILLING DATE: May 18, 1994
ELEVATION: 43.50 feet
DATUM: NGVD

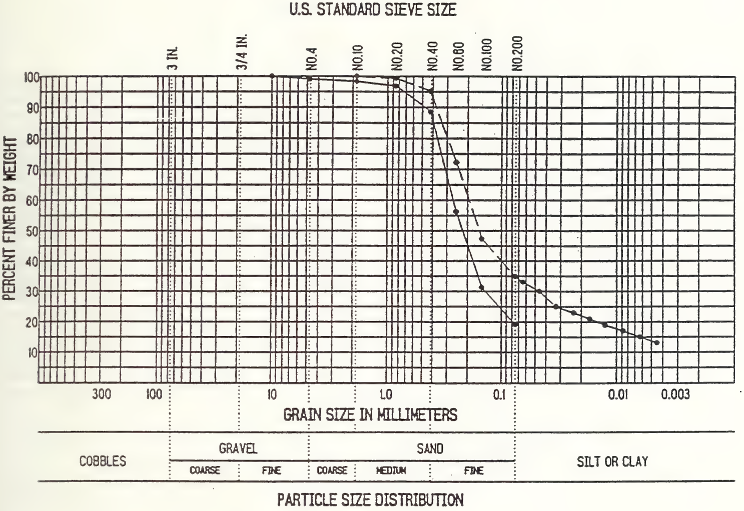
DEPTH (FEET)	BLOW COUNT	TORVANE SHEAR STRENGTH (PSF)	POCKET PENETROMETER COMP. STRENGTH (TSF)	PHOTOVAC TIP READING (PPM)	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT (%)	ATTERBERG LIMITS PLASTIC LIMIT (%)	UNCONFINED SHEAR STRENGTH (PSF)	ADDITIONAL TESTS
					"ALLUVIUM (Qal)" SILTY SAND (SM) brown, damp to moist, loose.						
	4				"ALLUVIUM (Qal)" SANDY SILT (ML) brown, moist, loose, fine grained sand, 52% fines.						GS
10	9				"ALLUVIUM (Qal)" POORLY GRADED SAND (SP) dark gray, moist to wet, loose, 2% fines.	100	22				Corr GS
	10				"ALLUVIUM (Qal)" SANDY SILT (ML) dark gray, moist to wet, loose to medium dense, 61% fines.						GS
20	15				"ALLUVIUM (Qal)" POORLY GRADED SAND with silt (SP-SM) gray, moist to wet, medium dense, medium to fine grained sand, 11% fines.						GS
	19		0.5		"ALLUVIUM (Qal)" FAT CLAY (CH) black, moist, soft to medium stiff, organic content 1.4%.		39	55	22		OR
30	12				"ALLUVIUM (Qal)" CLAYEY SAND TO SILTY SAND (SC/SM) light blue-gray, moist, medium dense, root fragments.						
	75/10"				"COLMA FORMATION (Qc)" POORLY GRADED SAND with silt (SP-SM) dark blue-gray, moist, very dense, with black staining and a layer of black clayey sand (SC) at 35 feet, some roots, weakly cemented.						
40	56		3.5		"COLMA FORMATION (Qc)" SILT (ML) blue-gray, moist, very dense, 6-inch layer of clay (CL-ML) at 40 1/2 feet, occasional layers of fine grained sand.						
	13		2.0		"COLMA FORMATION (Qc)" LEAN CLAY (CL) light blue-gray, moist, stiff to very stiff, with brown organic bands at 1 to 2-inch spacing.		21	31	13		
50	80/11"				"COLMA FORMATION (Qc)" SILTY SAND (SM) light blue-gray, moist, very dense, fine grained sand.	122	14				
					"COLMA FORMATION (Qc)" LEAN CLAY (CL) light orange-brown, moist, very stiff.						

HEET 1 of 2

LEGEND TO LOGS ON PLATE A-1.0

PLATE A-2.26

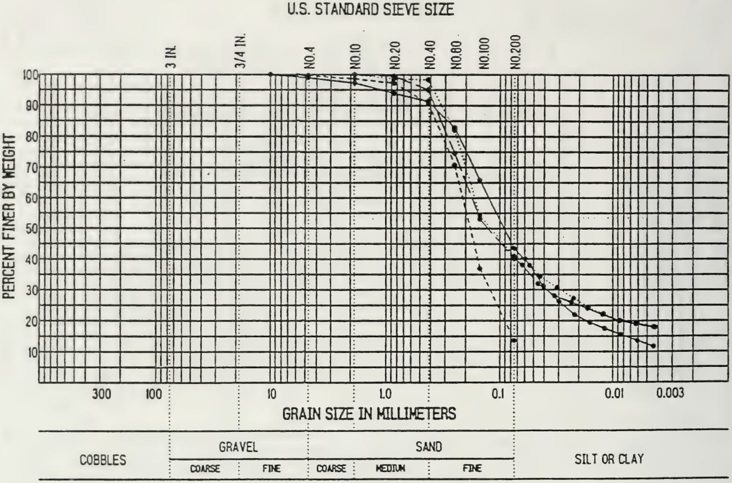
GRAIN-SIZE DISTRIBUTION



LINE SYMBOL	DRILL HOLE NO.	DEPTH (FEET)	CLASSIFICATION
———	B-23	20	SM
— —	B-23	25	SM

....			

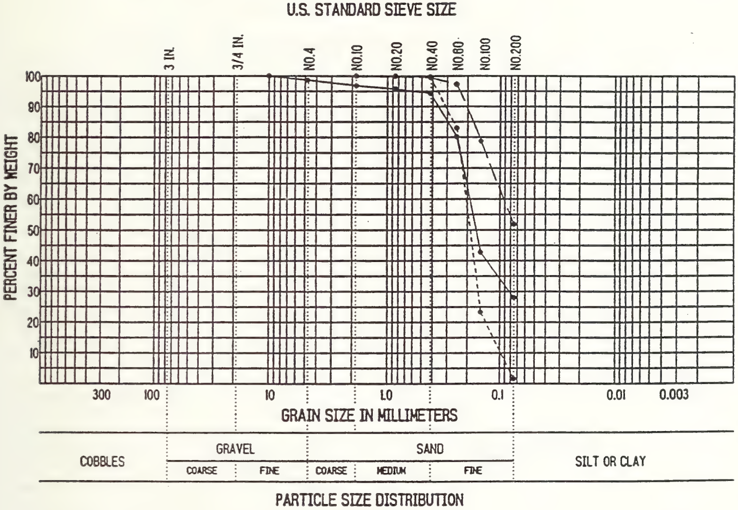
GRAIN-SIZE DISTRIBUTION



PARTICLE SIZE DISTRIBUTION

LINE SYMBOL	DRILL HOLE NO.	DEPTH (FEET)	CLASSIFICATION
———	B-24	6	SC
— —	B-24	10	SM
-------	B-24	15.5	SM
··········	B-24	35	SC

GRAIN-SIZE DISTRIBUTION



LINE SYMBOL	DRILL HOLE NO.	DEPTH (FEET)	CLASSIFICATION
———	B-25	30.5	SC
— —	B-26	5	ML
-------	B-26	11	SP
....			

Final Revision March 11, 1996
Prepared by Vicki Reynolds, Wetland Field Biologist

CONSIDERATIONS FOR POTENTIAL MITIGATION SITES
PROPOSED BART-SFO EXTENSION PROJECT
Corps File Number 19669S91

During the course of establishing the limits of jurisdiction for the proposed BART-SFO Extension Project, pursuant to Section 404 of the Clean Water Act ("CWA"), a parallel process was ongoing relative to identification of appropriate mitigation sites to offset permanent impacts to waters of the U.S.. The following discussion identifies sites considered, and briefly discusses current conditions as well as reasons for their elimination from consideration. See attached excerpts of San Francisco South and Montara Mountain quad sheets for approximate site locations.

1. West of Bayshore Parcel, San Francisco International Airport ("Airport") property: A number of wetland creation sites on the West of Bayshore Parcel have been suggested in both the Draft Environmental Impact Report/Technical Appendix (January 1995), and in the Focused Recirculated Draft Environmental Impact Report/Supplemental #2 Draft Environmental Impact Statement (FRDEIR/S#2 DEIS, September 1995).

In its comments to these documents, the Airport stated that in creating additional wetland habitats to compensate for the loss of other onsite wetland habitats BART must not "reduce the utility of the Airport's use of that property...and [must not reduce] the [Airport's] ability to develop facilities to meet future needs." In informal discussions with the Airport, it was not clear how BART could create wetland habitats on the West of Bayshore Parcel without reducing the Airport's utility of this parcel. Consequently, BART eliminated any wetland creation or compensation measures within the West of Bayshore Parcel from further consideration.

2. Colma Creek within Orange Memorial Park: This site was suggested by a South San Francisco Planning Department employee as a potential mitigation site. The creek splits the park, and several foot bridges are utilized to connect the two sides.

The creek through this reach is a concrete-lined flood control channel with a ± 50 year flow capacity, fulfilling the County Flood Control District's goal for Colma Creek. Bottom of the channel through this park is approximately 10 feet below the adjacent Park grades.

Several reasons led to the decision to eliminate this site from consideration. They included the status of the creek in this area, namely that it involves a portion of the flood control channel which is in its completed state. Any mitigation plan would require excavation to a similar elevation as the creek bottom to accomplish a self-sustaining aquatic system. By definition, all mitigation sites should maintain themselves with the minimum of human intervention. To design a mitigation site in the park, without extensive excavation, would require installation of some kind of pump system. A concept like that is apt to not be acceptable to the resource agencies.

Secondly, the northeastern side of the creek contains several large park buildings, leaving only the southwestern bank as an appropriate area for mitigation development. This bank however includes several ball fields, with associated parking, a rare commodity in urban areas.

Thirdly, any self-sustaining mitigation scheme would likely generate enormous adverse publicity, for any or all of the reasons listed above.

Finally, since the proposed BART-SFO Extension Project is partially funded by Federal Transportation monies, the project must comply with Section 4(f) of the Federal-Aid Highway Act of 1968. This restriction within the Act seeks to preserve public park and recreation lands. Creation of wetland habitats in Orange Memorial Park, to the possible detriment of existing park activities, would be interpreted as a potential "take", and precluded by the Act.

3. Colma Creek immediately upstream of Orange Memorial Park, and downstream of Chestnut Avenue: This is a site situated on the northeastern bank of the creek, currently occupied by several large greenhouses and a truck farm. A flood control levee/maintenance road borders the creek, which has also been improved to its final 50-year flow capacity. Several signs identify this site as being the property of the California Water Service Company.

Although this site does not have similar public uses as the downstream park, the fact that it is adjacent to a completed portion of the County's flood control project brings with it similar design and adverse publicity issues as did Orange Memorial Park. No further consideration was given to the site.

The next sites were preliminarily identified from high altitude aerial photos of the proposed BART-SFO Extension Project alignment. Site visits were subsequently conducted to complete the site assessments relative to mitigation potential.

4. Crystal Springs, San Bruno City Park, south side of Crystal Springs Road, westerly of Cypress: This site is within the Crystal Springs Creek watershed, aka. Cupid Row Canal at the point the creek crosses the proposed BART-SFO Extension Project alignment.

The creek meanders through a small neighborhood park, defined by mowed and maintained lawns and small picnic areas.

The creek's path does appear to be mostly natural. The creek itself is shallow, approximately 2 feet deep, and varies in width from 5 to 10 feet. Most of the creek bottom is roughly concrete-lined, and small grade structures have been added over time.

Mitigation within this park would involve conversion of most of the passive use portions (i.e., the picnic and lawn area), to enhance habitat of the creek. A large ball field, with concession stand, was noted to the south away from the creek.

This site was eliminated from consideration due to its neighborhood location, and the need of any habitat enhancement plan to use up much of the passive use areas. Such a plan would have its own local neighborhood controversy.

Further, any design would involve mostly enhancement rather than creation, making the acreage exchange rate larger to offset permanent impacts. As such, this site would be needed in combination with others.

Lastly, due to the proposed concept, this site would not comply with Section 4(f) of the Federal-Aid Highway Act.

5. Crystal Springs, Junipero Serra Park, southern side of Crystal Springs Road, southeasterly of Highway 280: The creek in this reach runs through a county operated park, and for the most part appears to be in its natural form. In several small areas, mainly adjacent to parking lots, the creek has been concrete-lined. Slopes in the park, adjacent to the creek, mostly appear to be very steep, with the creek running at the bottom of a ravine.

Mitigation opportunities in this park might be available, but very possibly would require something like a dam, due to the prevailing landscape. The most likely area suitable for such dam construction, based on topography, would be downstream of the parking area off of Crystal Springs Road. The result would be conversion of the parking area into a lake with adjacent wetlands, not exactly comparable to the wetland habitat permanently impacted by the proposed project.

This concept was not investigated any further due to potential costs and difficulties associated with dam construction; dissimilar wetland/aquatic habitat creation; and the likelihood that this site may also be inconsistent with Section 4(f) of the Federal-Aid Highway Act.

6. Upper reaches of San Felipe Creek, vicinity of Bayview and Barcelona Streets: The creek at this point is deeply incised, crossing behind several homes. Tree canopy is dense and well developed with oaks. Creek banks appeared stable, and there seemed to be no opportunities to enhance or create additional habitat in this area.

7. Millbrae Creek, westerly of Minorca Way, north of Millbrae Avenue: The creek in this reach crosses along the westerly

boundary of a small neighborhood park before crossing under Millbrae Avenue. Being at the bottom of a relatively steep slope, the creek is fairly natural in appearance, although vegetated with ornamental herbs and vines. Large oaks grow on both sides of the creek.

Aside from eradicating the ornamentals, there appeared to be no opportunity for mitigation at this site. This site was therefore eliminated from further mitigation consideration.

8. Millbrae Creek, south of Millbrae Avenue, north of Mills High School: The creek in this reach emerges from a culvert which passes creek flows through several residential backyards, and then begins to parallel the south side of Millbrae Avenue. The USGS quad sheet (Montara Mountain) indicates that the creek was realigned sometime between 1956 and 1980. A residential neighborhood lies opposite of the creek, north of Millbrae Avenue, while play fields associated with Mills H.S. are several hundred feet to the south.

The creek is showing severe signs of erosion, being virtually unvegetated and incised. A grove of mature eucalyptus trees overtop the creek's path. A few mature oaks are scattered under the eucalyptus.

This portion of creek does have possible mitigation potential and certainly enhancement possibilities due to its highly degraded condition. A primary requirement for any habitat design, in addition to creating a stable creek alignment, would include removal of the eucalyptus trees as well as some of the topsoils. Eucalyptus trees emit an oil which can eventually preclude growth of any other plants. The oil is residual, hence the requirement for removal of some the topsoils.

With such preparation, there would be opportunity to include development of small wetlands and riparian plantings.

This site, however, was not pursued any further due to the potential controversial issues surrounding removal of the eucalyptus trees. Without this step, habitat mitigation and/or enhancement would not be feasible.

Other sites investigated and considered for mitigation include several, with varying configurations, immediately downstream of the proposed South San Francisco Station; vicinity of South Spruce Avenue; as well as some in the vicinity of the West of Bayshore Parcel. They are discussed briefly below.

9. Downstream of proposed South San Francisco Station, vicinity of Colma Creek: The proposed mitigation site is within this reach of Colma Creek, chosen since it was within the lands to be under future BART ownership within the proposed alignment. However, prior to final selection of the mitigation site, several other sites and configurations were also considered in this vicinity.

a. Golf Driving Range: One of these sites is to the east of the current proposed mitigation site, in the location of an existing golf driving range. A relatively flat site, it approximates 5.4 acres in size. A preliminary design for this site was conceptualized which would have created a meandering low flow creek, fed by Colma Creek, together with overbank flood zones and adjacent seasonally saturated zones. Higher landscape areas would have been developed as transitional uplands and riparian areas. Area of jurisdictional acreage, including the creek channel, overbank flood zones and seasonally saturated zones, to have been created was estimated at 2.3 acres.

This site was eliminated in part because it would have involved displacement of an existing business, namely the golf driving range. This site also was not part of the properties slated for purchase as part of the proposed BART alignment in this reach. Accordingly, this site was not considered any further as a potential mitigation site.

b. Site Southwest of Proposed Colma Creek FCC Improvements: Another site considered in this vicinity included a parcel approximately 2500 feet downstream of the proposed BART SSF Station site, southwest of the future improvements to the Colma Creek FCC. This site, approximately 6.45 acres, is bisected by BART's proposed alignment.

The mitigation concept for this site was similar to that of site 9.a., above. It proposed to create a meandering low flow channel, fed by Colma Creek, together with overbank flood zones and adjacent seasonally saturated zones. Higher landscape areas would have been developed as transitional uplands and riparian areas. About one acre, adjacent to El Camino Real, would have been left as it currently exists. This concept included postponement of mitigation implementation until completion of BART's subway construction and use of a portion of the site as a contractor's lay down area. As such, portions of the mitigation would have been positioned over BART's subway box. Jurisdictional area to have been created with this concept was about 2.7 acres, involving the creek channel, overbank flood zones and seasonally saturated areas.

This site was eliminated from consideration since most of it was not within the properties planned for purchase as part of BART's proposed alignment.

10. Vicinity of South Spruce Avenue: This is an area, north of South Spruce Avenue which is being impacted by BART's proposed subway construction. Consisting of a drainage ditch and seasonal wetland, they are slated for restoration following construction. Because of its current wet conditions, this area was investigated for potential in increasing the size of the wetland for mitigation. The drainage ditch is not hydrologically connected to the wetland, its bottom being 4 - 5 feet lower than that of the wetland. A small berm separates these two features,

providing even further hydrological separation. The wetland appears to be sustained by local surface runoff. Because of the questions relative to adequate hydrology for any meaningful increase of the wetland, this site was eliminated from further consideration.

In addition, there is an access road and ventilation building planned for installation by BART just north of the subject wetland, further precluding value of this area for mitigation.

Vicinity of West of Bayshore Parcel: Various sites in the vicinity of the West of Bayshore Parcel were considered, and are discussed separately in the following narrative.

11. The existing community garden, north of the West of Bayshore Parcel and Cupid Row Canal, property of the City of San Bruno: The garden site itself is about 1.4 acres in size. It is separated from Cupid Row Canal by an access road which provides entry to a 4-H farm, immediately east of the garden; and to the northeastern arm of the West of Bayshore Parcel.

Mitigation concepts for this site included the garden site by itself; or the garden site and aforementioned access road together.

a. Garden Site: Ground water levels are fairly shallow through this area, and this concept would have involved excavation of a depression down to the water table. It would have resulted in fairly steep slopes to maximize jurisdictional area. The first concept did not seem very plausible, due to the separation of the area from any adjacent aquatic habitat; and the amount of excavation necessary to create wetland habitat of inadequate size (± 1 acre), and questionable habitat utility. This concept was also potentially controversial relative to the conversion of a community garden to a wetland. Additionally, this site would be needed in combination with others. The site was therefore eliminated from further consideration.

b. Garden Site and Access Road: The second mitigation concept considered a larger parcel, an estimated 2.2 acres, through inclusion of the southern access road. This site would have involved similar excavation, but also could have been hydrologically linked to Cupid Row Canal, if necessary. It would have been biologically linked to the Canal due to its proximity. It was preliminarily estimated that about 2 acres of wetland could be created with this idea.

This site was dismissed for several reasons, including the potential controversy of converting a community garden to a wetland. To the north of the community garden is a ball park known as Lyon's Field. Eliminating the access road would have also land-locked the 4-H farm, necessitating some other access point, possibly through appropriation of a portion of Lyon's Field. Such an alternative would then have placed this mitigation concept in conflict with Section 4(f) of the Federal-Aid Highway Act.

12. Widening of Cupid Row Canal: Another concept considered in this general area involved the regrading of the northern bank of Cupid Row Canal in the reach downstream of the proposed BART alignment. It would have included the strip of land between the creek and property fence paralleling the southern boundary of the access road discussed above in 9.b.. This idea proposed to widen the Canal's bottom and to regrade the northern bank to create additional area for permanent and seasonal wetland development. The total estimated area of jurisdictional wetland which would have been created was 0.67 acre, minus 0.33 acre contributed by the existing Cupid Row Canal. Final resulting increase of wetland would have only been about 0.34 acre.

The low mitigation acreage was one of the reasons that this site received no further consideration. However, there was also the fact that this concept was being proposed on land under ownership of the San Mateo County Flood Control District, and the possible conflict a mitigation wetland might encounter with flood control goals.

13. Property surrounding the PG&E substation in the southwestern part of the West of Bayshore Parcel: This area consists of approximately 5 acres surrounding an existing PG&E substation situated in the southwestern part of the West of Bayshore Parcel. No jurisdictional investigation was performed as part of this mitigation investigation, but several obvious wetland areas do encroach onto the property along the eastern side. Hydrology appeared seasonal for these wetlands. No surface hydrology is evident, and therefore any mitigation scheme would have relied on the expected high water table found in the general area as well as rainfall. Preliminary mitigation concepts had envisioned expanding the encroaching wetlands further west over the site. Several existing access roads also would need relocation to have opened up a cohesive mitigation site.

This site was eliminated as a potential mitigation site in part due to the questionable hydrology and level of investigation which would be necessary relative to this factor prior to any mitigation design. Another elimination factor involved the site's ownership by PG&E, and that entity's potential future needs for a mitigation site should any of their eventual projects impact wetlands in the vicinity of the West of Bayshore Parcel.

14. Linear parcel of land, west side of Caltrain: This prospective mitigation site consists of a linear parcel of land between the west side of Caltrain and the city streets and/or existing school or residences. Width of this area averages 80 feet.

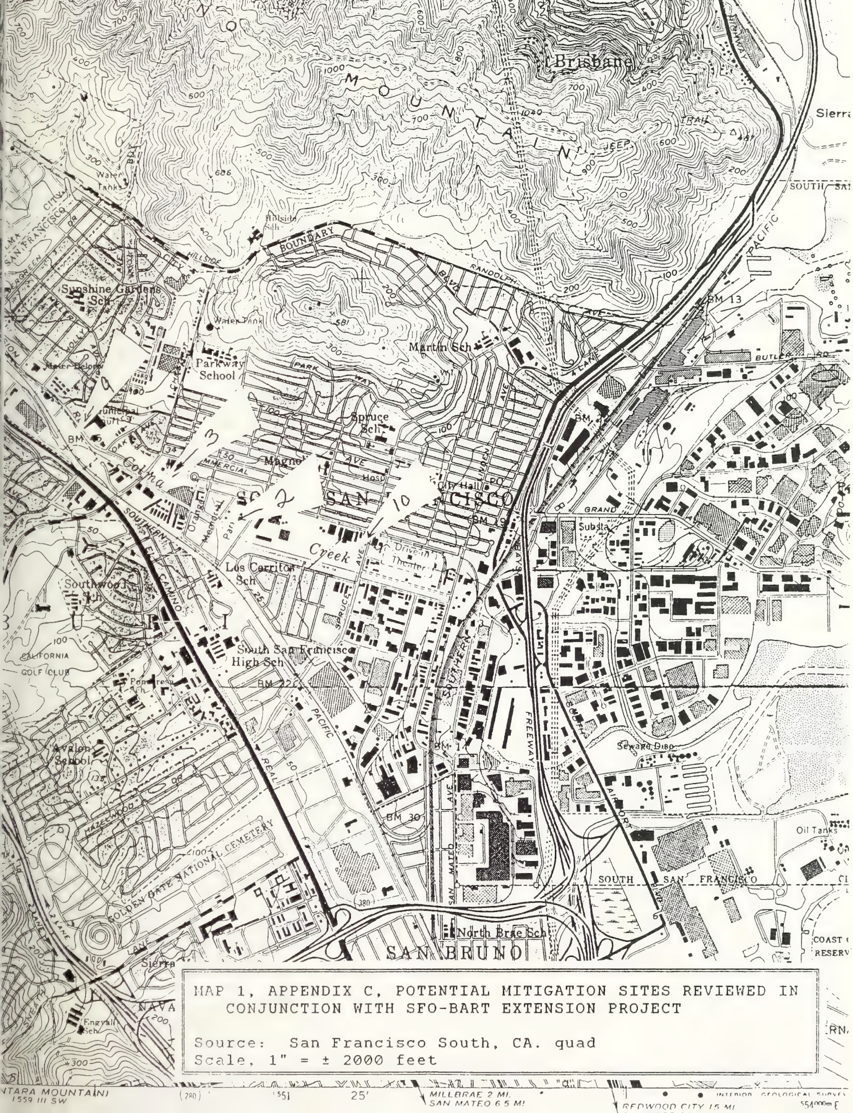
Several mitigation concepts were being considered until ownership in this area soon became an issue as well. The Caltrain track, from San Francisco to San Jose, is owned and operated by the Joint Powers Board ("JPB"). JPB envisions, sometime in the future, that they will construct a third track which will parallel the west side of Caltrain, to be utilized by an electric train. As such, at least half of this linear parcel west of Caltrain is being reserved for such future use, and is not available for mitigation. Without the JPB property, the remaining parcel has limited potential for wetland mitigation, if any.

Even without the ownership situation, there were other questions arising as to the level of quality which could be achieved for any of the wetland concepts. Most of the wetlands and vegetated ditches along the western portion of the West of Bayshore Parcel receive runoff from the numerous storm drains draining the residential areas further west. It does not appear that any of these outlets are equipped with debris racks or grease traps. Consequently, most of the existing wetlands and ditches are littered with debris and, when flooded, the water is covered with an oil sheen. The odor of petroleum is fairly strong in some of the quieter water areas. During the summer, one of the ditches paralleling San Antonio Avenue had been used as an oil changing area, as evidenced by the oil in the ditch and litter of an oil filter and oil containers. All of the wetland concepts were planning to rely on the surface waters from these outlets, and water quality, therefore, was a major concern for any future mitigation proposal.

Another issue associated with some of the mitigation concepts was the amount of excavation which would be necessary to reach a grade capable of supporting wetlands. Due to the linear shape of the area, slopes into the wetlands at some of the areas were going to have to be steep. Steep slopes limit the amount of diversity available relative to hydrological zones to be created in a wetland situation, hence limiting the kinds of plant communities which can be supported by the wetland.

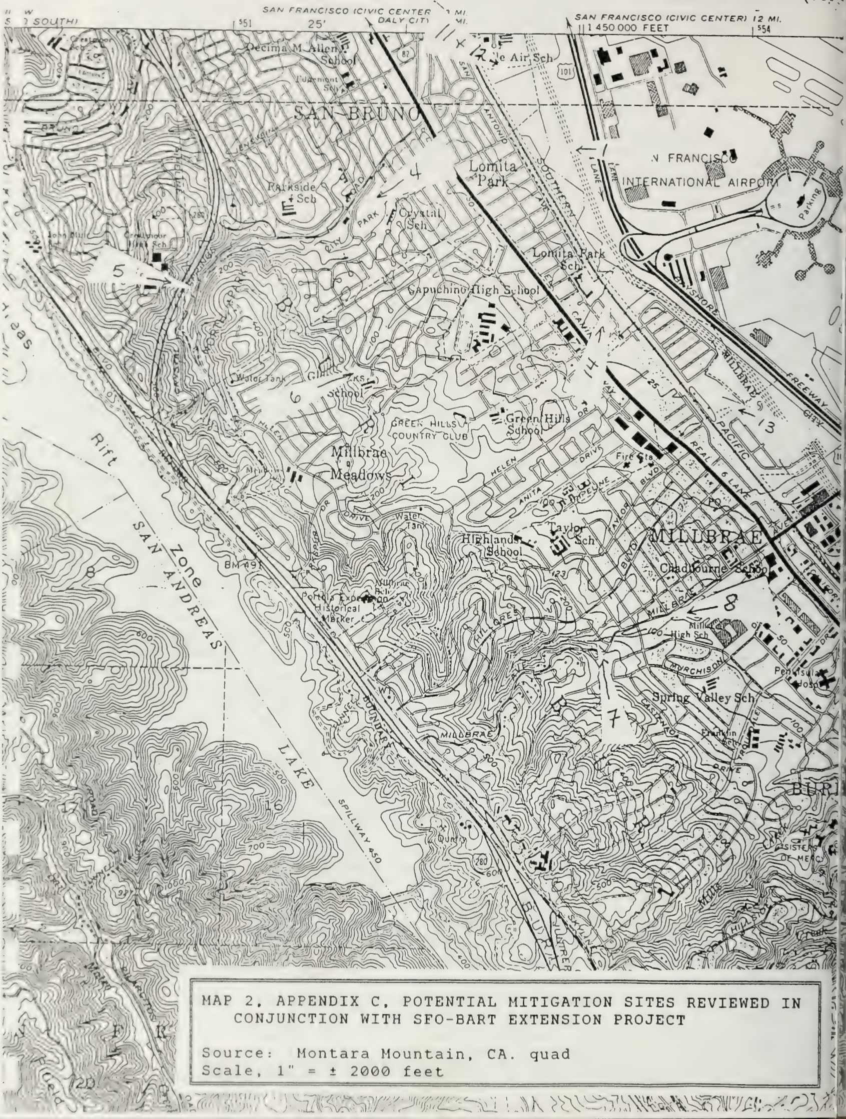
Flooding is yet another issue associated with this particular area. The wetland mitigation site within the southern portion of this west of Caltrain area is adjacent to the backyards of several residences as well as a school yard. Preliminary opinions of the hydrologist, Dr. Fred Locher, indicated that potential flooding from any wetland mitigation site was not an issue to these properties if they were separated from the site by flood walls. Nevertheless, flooding potential is an issue to these adjacent residents, and any proposed mitigation plan in this southern reach would be expected to be subjected to a great deal of disagreement.

As such, this linear parcel currently provides little opportunity for mitigation creation, while involving some very major issues. Therefore, it is no longer being considered for potential mitigation uses.



MAP 1, APPENDIX C, POTENTIAL MITIGATION SITES REVIEWED IN CONJUNCTION WITH SFO-BART EXTENSION PROJECT

Source: San Francisco South, CA. quad
Scale, 1" = ± 2000 feet



MAP 2. APPENDIX C, POTENTIAL MITIGATION SITES REVIEWED IN CONJUNCTION WITH SFO-BART EXTENSION PROJECT

Source: Montara Mountain, CA. quad
Scale, 1" = ± 2000 feet

ANNUAL VEGETATION DATA SHEET--TRANSITIONAL TREES, SHRUBS & VINES
YEARS 3 - 5
Bay Area Rapid Transit District, San Francisco Airport Extension
Colma Creek Mitigation Site
Corps File Number 19669S91

Date: Monitoring Year:

Monitoring Conducted by:

Plant Community, as Identified in Mitigation Proposal:

Clump/Zone:

Stratum (i.e., tree, shrub, herbaceous/vine):

Species	Signs of natural recruitment/ reproduction (describe)	Density of growth (stem density)	Overall health of species in clump/zone (describe)	Percent cover

Overall health and vigor of clump/zone, including growth and freedom from disease; any other comments:

Root development (# of random samples/species):

Success Criteria Met? Yes____ No____

Comments:

ANNUAL VEGETATION DATA SHEET--HERBACEOUS WETLAND ZONES
Bay Area Rapid Transit District, San Francisco Airport Extension
Colma Creek Mitigation Site
Corps File Number 19669S91

Date: Monitoring Year:

Monitoring Conducted by:

Plant Community, discussed in Mitigation Proposal:

Wetland Unit:

Transect Number: Quadrat Number:

Species	% cover	Signs of reproduction (describe)	Overall health (describe)

Overall health; diversity; if within area of soil probe, describe root condition, etc.; other comments:

Success Criteria Met? Yes___ No____

Comments:

ANNUAL VEGETATION DATA SHEET--TRANSITIONAL TREES, SHRUBS & VINES
YEARS 1 AND 2
Bay Area Rapid Transit District, San Francisco Airport Extension
Colma Creek Mitigation Site
Corps File Number 19669S91

Date: Monitoring Year:

Monitoring Conducted by:

Plant Community, as Identified in Mitigation Proposal:

Clump/Zone:

Species	Percent survival

Other comments (include overall clump/zone health and vigor):

Success criteria met? Yes____ No____

Comments:

WILDLIFE MONITORING FIELD DATA SHEET
Bay Area Rapid Transit District, San Francisco Airport Extension
Colma Creek Mitigation Site
Corps File Number 19669S91

Date:

Monitoring Year:

Monitoring Conducted by:

Avian species	Habitat Location/ Time of day	Activity?

Other Wildlife species	Habitat Location/ time of day	Activity?

General observations, comments:

U.S. Department of Interior–Section 106

- Section 106 Findings of Effects
- SHPO Concurrence with Section 106 Finding of Effects

  Letter dated April 18, 1966 regarding findings

  Letter dated April 18, 1996 regarding MOA
- Signed Memorandum of Agreement for the Arched, Cut-Stone Bridge

FINDING OF EFFECT

FOR THE POTENTIAL IMPACTS OF THE PROPOSED BART/SAN FRANCISCO AIRPORT EXTENSION ON HISTORIC PROPERTIES

SAN MATEO COUNTY

FEBRUARY 1996

PREPARED BY:

San Francisco Bay Area Rapid Transit District
West Bay Extensions
1000 Broadway 4th Floor
Oakland CA 94609

ON BEHALF OF:

Federal Transit Administration
Region 9
201 Mission Street Suite 2210
San Francisco, CA 94105

FINDING OF EFFECT
For the Potential Impacts of the Proposed BART/San Francisco Airport Extension on Historic Properties
San Mateo County

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I. INTRODUCTION

This Finding of Effect documents the effects of the proposed undertaking -- the BART-San Francisco Airport Extension Project -- on historic properties identified in the County of San Mateo. The Federal Transit Administration (FTA) is the sponsoring federal agency for the proposed project. The San Francisco Bay Area Rapid Transit District (BART) and San Mateo County Transit District (SamTrans) are local co-sponsors of the proposed project, which would extend BART rail transit service to the vicinity of the San Francisco International Airport.

Cultural resources studies for the BART-San Francisco Airport (BART-SFO) Extension Project were conducted during the 1991-1996 period. The potential BART-SFO extension alignment (approximately eight miles) was reviewed for archaeological, historical, and architectural qualities. These reviews included field studies to locate and assess any properties within the study area which were potentially eligible for the National Register of Historic Places (referred to as NRHP or National Register).

Environmental documentation, in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), has been prepared which analyze several project alternatives. A Locally Preferred Alternative (LPA) was selected in November 1995 in accordance with FTA guidelines and is currently being analyzed as the proposed project. The proposed route of the LPA is analyzed in this document and is referred to as the undertaking[1].

The Area of Potential Effect (APE) is estimated as one standard parcel deep on either side of the LPA corridor. For odd sized or shaped parcels, best judgement has been used by the preparers to consider appropriate APE boundaries. The APE has been included in background reports as part of the process to identify eligible properties. Within the APE, a total of ten properties were identified as eligible for, or listed on, the National Register[2]. These properties are:

---

[1] Under the FTA environmental process, a LPA is selected as the focus of the NEPA environmental document and included in the Final Environmental Impact Statement (EIS) for obtaining a federal Record of Decision on the project. Documentation in compliance with Section 106 is therefore prepared for that LPA. Under CEQA, the BART and SamTrans Boards of Directors are required to consider all other alternatives, in addition to the LPA, before adopting a project. In the event that an alternative other than the LPA is adopted by BART and SamTrans, supplemental documentation analyzing any new or different potential effects on historic properties would be prepared and a supplementation and/or revision to this Finding of Effect would be submitted to the appropriate agencies.

[2] In addition, one area which has been previously identified as a prehistoric site is located within the APE. This site has been determined not eligible for NRHP because no traces of the site could be found from preliminary testing due to the placement of extensive utility lines and other previous disturbances. Because this site was discussed in the draft environmental documentation for the project, it is included in this Finding of Effect and discussed in Appendix A.

- Italian Cemetery District
- Home of Peace/Hills of Eternity Cemetery District
- Cypress Lawn Memorial Park Cemetery District
- Holy Cross Cemetery District
- Salem Memorial Office Building
- Old Colma Railroad Station
- Lagomarsino Farm District
- A cut stone bridge in South San Francisco
- A 1940's bungalow-style residence (540 San Antonio Blvd)
- Millbrae Train Station

Of these properties, one was found to be already on the National Register (i.e., the Millbrae Train Station) and one was already found to be eligible for the National Register (i.e., the Old Colma Railroad Station). The other eight properties were found to be potentially eligible in response to research and background reports conducted in the corridor for this undertaking.

FTA and BART contacted the State Historic Preservation Officer (SHPO) throughout the impact analysis period to determine eligibility for properties within the APE [3]. The SHPO has provided official concurrence that the four cemetery districts are eligible for the NRHP. For the remaining properties (Salem Memorial Office Building, Lagomarsino Farm District, cut stone bridge, and the 540 San Antonio Boulevard residence), research indicates that these properties are likely to be eligible for the NRHP. These four properties were included in the project's original draft environmental document in 1992 as potentially eligible and were similarly included in supplemental environmental draft documents in 1995. These properties were analyzed for potential adverse effects. This Finding of Effect includes these properties which have been identified as potentially eligible by BART/SamTrans and the FTA, and treats them as eligible.

This document contains a separate assessment for each of the 10 properties considered to be eligible for the NRHP, applying the requisite criteria of effect and adverse effect (set forth in Code of Federal Regulations (CFR) Title 36, Part 800). Of the properties analyzed in this Finding of Effect, the determination has been made that the project would have an adverse effect only on one property: the cut stone bridge. Table 1 summarizes

---

[3] Five background historic documents were submitted to the SHPO (three volumes of the Historic Architectural Survey Report, one Historic Resources Evaluation Report and one Archeological Resources Technical Report) from November 1993 to February 1996. These documents were developed and submitted over an approximate three year period as the LPA alignment became refined. Therefore, some documentation has only recently been completed and submitted to the SHPO. Given the timeframe for this project development process, formal concurrence from SHPO on the eligibility of the potentially eligible properties proposed in the background documents has been provided for three of these five background reports. Appendix C lists the background reports submitted to the SHPO and the status of the responses as well as correspondence among BART, FTA and the SHPO.

TABLE 1

Summary of Findings

Property	NRHP Status	Finding of Effect
Italian Cemetery District	Eligible	No Effect
Home of Peace/Hills of Eternity Cemetery District	Eligible	No Effect
Cypress Lawn Memorial Park Cemetery District	Eligible	No Effect
Holy Cross Cemetery District	Eligible	No Effect
Salem Memorial Office Building	Eligible *[4]	No Effect
Old Colma Railroad Station	Eligible	No Effect
Lagomarsino Farm District	Eligible *	No Effect
Cut Stone Bridge	Eligible *	Adverse Effect
540 San Antonio Blvd Residence	Eligible *	No Effect
Millbrae Train Station	Listed on NRHP	No Effect

---

[4] For properties marked with an asterisk, documentation on concurrence for the property's NRHP eligibility has not yet been recieved from the SHPO.

the properties and the determination. A draft Memorandum of Agreement has been prepared for the cut stone bridge and included in Appendix D.

This document shall be submitted to the State Historic Preservation Officer for concurrence. After obtaining SHPO's concurrence, the FTA shall notify the Advisory Council on Historic Preservation (ACHP) and submit this report to serve as documentation in accordance with CFR 36 Part 800.5.

II. STUDY FRAMEWORK

A. Description of the Undertaking

The corridor for the proposed BART-SFO Extension Project area runs mainly along a former Southern Pacific Transportation Co (SPTCo.) right-of-way and the current Peninsula Corridor Joint Powers Board (JPB) right-of-way. The proposed new project would begin at the new BART Colma Station in the Town of Colma and run to San Francisco International Airport and the City of Burlingame. FTA, BART and SamTrans conducted numerous studies to identify and assess the impacts of alternative routes and different station locations. Figure 2-1, Regional Location, identifies the cities along the project route and provides an illustration of the project within the region. Figure 2-2, Vicinity Map, provides a schematic of the alignment, profile and station locations along the proposed route. The specific alignment of the Locally Preferred Alternative (LPA) is described from north to south as follows:

Town of Colma. From the end of the Colma BART Station tailtrack (opened in February 1996), the alignment would extend south in cut-and-cover box (subway) via the SPTCo. right-of-way and continue one mile before crossing under Mission Road to the Colma/South San Francisco city limits near the future extension of Hickey Boulevard.

City of South San Francisco. From the city limits of South San Francisco, a proposed South San Francisco Station (also known as Hickey Station) would be located at the end of the future extension of Hickey Boulevard. The alignment would continue in subway within the SPTCo. right-of-way for approximately 1.4 miles, passing under Chestnut Avenue, Twelve Mile Creek, and Orange and South Spruce Avenues. South of South Spruce Avenue, the alignment would remain below grade in a retained open cut to the proposed San Bruno Station (also known as Tanforan Station) at the South San Francisco/San Bruno city limits.

City of San Bruno. South of the San Bruno Station, the alignment would run in subway along Huntington Avenue through San Bruno. Upon approaching the San Francisco International Airport, a set of tracks rises at-grade and continues on a "mainline" south to Millbrae while another set rises to become aerial. The aerial tracks curve to the east, rising over vacant property and over Highway 101 into a proposed San Francisco International Airport station. A parallel set of tracks curve westerly from the airport station and meet the mainline tracks further south. These aerial tracks are referred to as the "aerial wye" as they extend into and out of the station at the airport in a "y" shape from the mainline track.

City of Millbrae. South of the aerial wye, the north-south mainline tracks would descend into subway along residential areas. The tracks ascend to at-grade right-of-way as they approach a proposed Millbrae BART/CalTrain Intermodal Station at Millbrae Avenue.

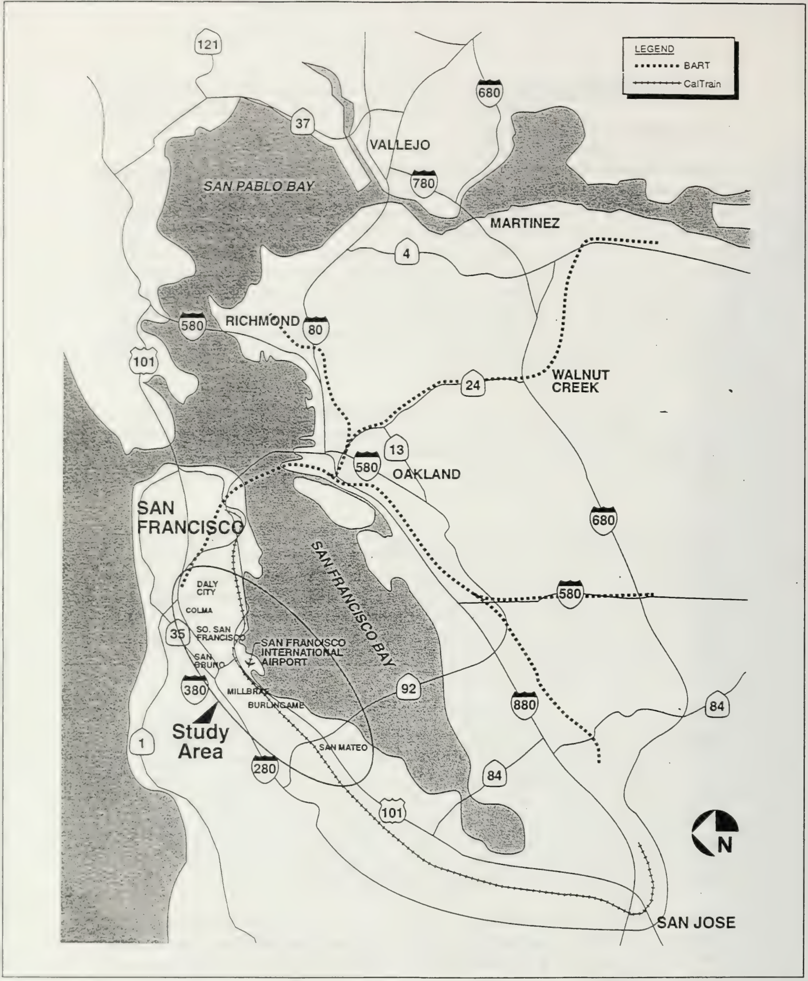


FIGURE 2-1

Project Study Area

BART EXTENSION INTO THE SAN FRANCISCO INTERNATIONAL AIRPORT

Line Alignment and Profile

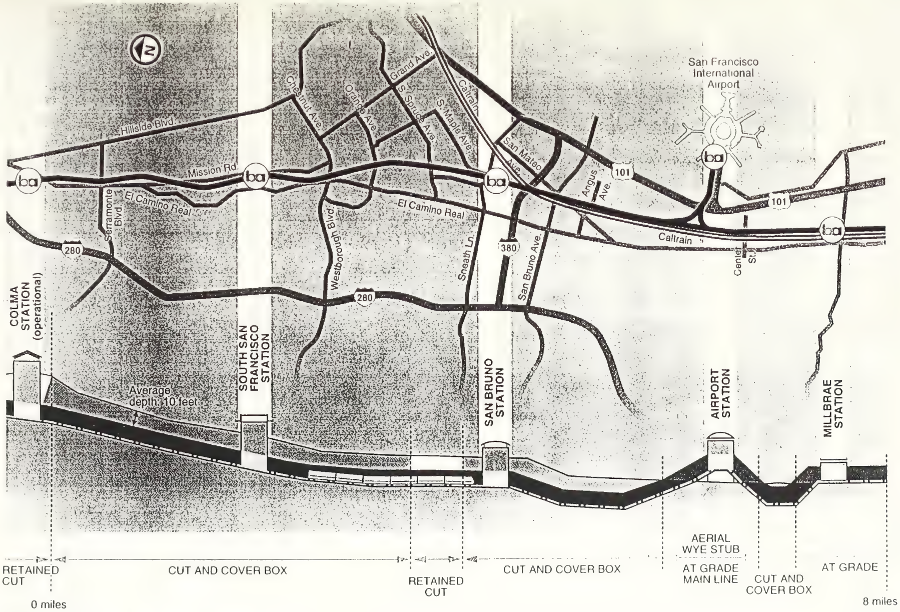


FIGURE 2-2

Vicinity Map

City of Burlingame. South of the Millbrae station, the BART tracks remain at-grade approximately 1500 feet into the City of Burlingame to accommodate tail tracks for storage and car turnaround.

B. Efforts to Identify Historic Properties

The effort to identify historic properties for this undertaking was conducted by a team of consultants led by Dr. Laurence H. Shoup (See Appendix B for list of preparers). This research was conducted in phases, as the LPA became refined[5]. The research described in this section resulted in five background reports submitted to the SHPO, which was the basis for SHPO determinations of eligibility:

- Historic Architectural Survey Technical Report (HASR) (for all proposed build alternatives, Colma BART Station to Highway 380 in San Bruno) - November 1993
- A Historic Resources Evaluation Report (HRER) of Seven Colma Cemeteries Colma California - June 1994
- Archaeological Resources Technical Report - December 1994
- Historic Architectural Survey Technical Report (HASR) Volume II: Alternative VI, Highway 380 to Trousdale Drive in Burlingame - August 1995
- Historic Architectural Survey Technical Report (HASR) Volume III: Alternative VI, Florida Avenue in San Bruno to Millbrae Avenue in Millbrae - January 1996

The research methodology was conducted by the research team as follows. As an initial step, the research team inspected key historic inventory lists, including:

- National Register of Historic Places
- California State Historic Preservation Office, Historic Property Data file
- California Archaeological Inventory at Sonoma State University, Northwest Information Center
- California Historic Landmarks

---

[5] Although the complete alignment now proposed as the LPA was selected in November 1995, historic research and agency coordination for this undertaking began in 1993 on the approximate northern one-half of the alignment which was common to all eight build alternatives being considered at that time. On April 28, 1995, Alternative VI was selected as the LPA by the BART and SamTrans Boards of Directors and focused historic research began on the southern segment of the alignment. For numerous reasons, BART and SamTrans identified a design option to Alternative VI, which included a new alignment in the southernmost third of the corridor as it accesses the San Francisco International Airport. The route which includes the design option to Alternative VI was later selected as the LPA in November 1995.

- California Inventory of Historic Resources
- historic resource lists for Colma, South San Francisco, San Bruno, and Millbrae

As a next step, the team undertook archival research for the historical overviews and inventory forms during 1993, 1995, and 1996 at the following locations:

- California State Library, Sacramento
- California State Railroad Museum Library, Sacramento
- City of Millbrae, Public Works Department
- City of San Bruno, Main Library
- City of San Bruno, Planning Department
- City of South San Francisco, Building Division
- Daly City Historical Society, Daly City
- San Mateo County Historical Association Library, San Mateo
- San Mateo County Government Center, Redwood City
- South San Francisco Public Library, Historical Society and Museum
- University of California, Berkeley Libraries: Bancroft, Map, Engineering, Environmental Design, and Main

In addition, the team conducted discussions about the study area history and other aspects of the project with:

- Cypress Lawn Memorial Park - James E. McKeown, James Wong, and Michael Sevanevik
- Eternal Home Cemetery - Meyer Kaplan
- Hills of Eternity Memorial Park - Naomi Tilsen
- Holy Cross Cemetery - Christine O. Stinson
- Home of Peace Cemetery - Judith A. Edmonson and Jose Reyez
- Italian Cemetery - Christopher Castagnola and Ida Luchessi
- Native Son Florist - James Gregoire
- Salem Memorial Park - Charlie Gerrans
- San Mateo County Historical Association - Marian Holmes
- South San Francisco Public Library, History Room - Kathleen Kay
- State Historic Preservation Office - Hans Kreutzberg and Gary Reinoehl

Historic architectural methods followed this research during 1993 and 1995. Field work conducted by the team consisted of a combination of aerial photography (a July 1946 photograph was used), archival research, and field survey to identify and locate all historic (over 50 years old) habitable or utilitarian structures within the project area. These were recorded, then photographed and evaluated for NRHP status.

The team found six general types of structures with in the project corridor's APE which could potentially qualify for the NRHP: residential buildings (most common), commercial/public buildings, transportation-related buildings (two), stone bridges (one), industrial buildings and farmsteads (two). The Southern Pacific Railroad line, airport utilitarian structures and several neighborhoods were also reviewed for their historic or architectural merit. The research team evaluated a total of 151 buildings or building complexes near or over 50 years of age; Historic Resources Inventory forms were prepared for these properties and included in the background reports.

In addition, seven cemeteries in Colma were closely evaluated to determine their eligibility as historic districts. The evaluation further assessed structures of historic or architectural merit within the cemeteries, thereby categorized as "contributing" to the historic district. An additional 67 properties were recorded as a samples of significant buildings, gravemarkers, and landscape features which can be considered contributing features to these cemetery districts. These structures or features were not individually submitted to the SHPO for eligibility determination.

With regard to prehistoric resources, an on-foot archaeological survey of the project area was undertaken by David Chavez, M.A., in 1991, and by Carolyn Rice, M.A., and Robyn Talman, M.A., in 1993. In addition, shovel testing and auguring were conducted in order to attempt to locate remains of a previously recorded prehistoric archaeological site, CA-SMA-299.

Potentially eligible resources were evaluated against Part 60.4 of Chapter 1 of CFR Title 36 which outlines the criteria for evaluation of properties for possible inclusion in the NRHP. The criterion listed below as A, B, C, and D are referenced in other sections of this document:

> The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
> B. that are associated with the lives of persons significant in our past; or
> C. that embody the distinctive characteristics of a type, period, or method of construction, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
> D. that have yielded or may be likely to yield information important in prehistory or history.

In addition, cemeteries, not ordinarily considered for listing on the NRHP, must meet additional special requirements before they can qualify. These special requirements are called Criteria Considerations; cemeteries must qualify under Criteria Consideration D which states:

> A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, from association with historic events or due to its informational potential can qualify for the National Register. (National Park Services, 1991:25, 34-35)

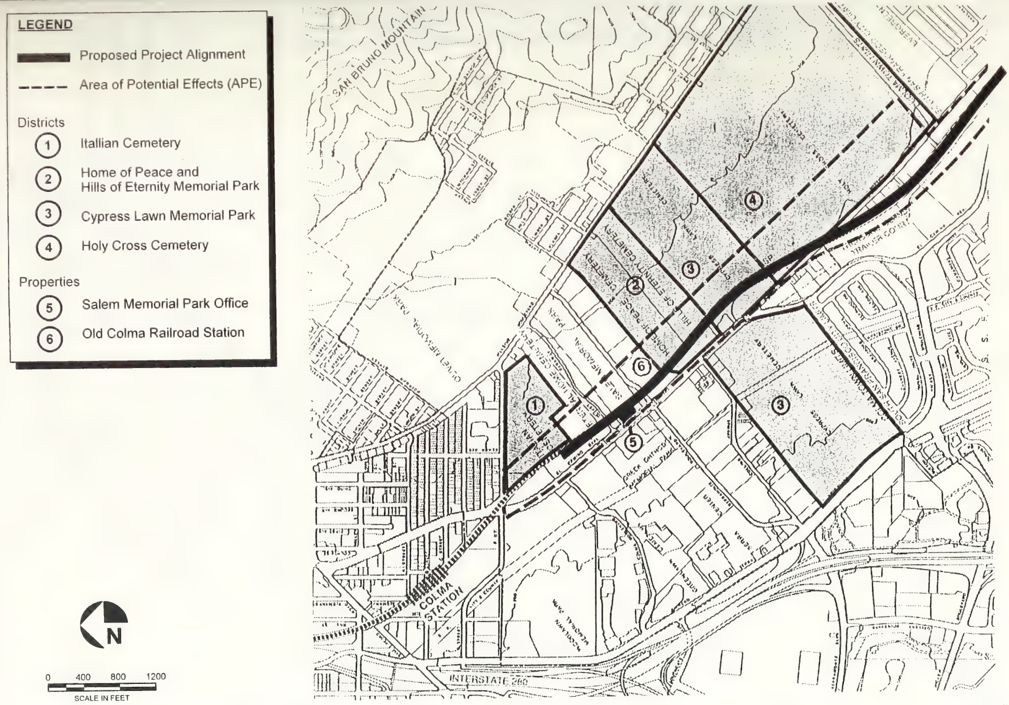
When these criterion were applied to properties in the corridor characterized as potentially eligible (over 50 years of age), the majority of these resources were not considered significant under the criteria. They lacked the requisite level of architectural or historical significance or have had their integrity seriously compromised. Most of the ineligible properties were single-family dwellings (1900-1940s) that were undistinguished. In addition, a large number of post-1946 buildings lying within the APE for this project were examined as part of this project, but none were found to have overriding significance. These factors eliminated the examined properties from potential eligibility. Documentation to support this evaluation is in the HASR's, which have been submitted to the SHPO for concurrence.

Table 2 lists the location of the eligible properties that were identified in this project corridor. Figures 2-3, 2-4 and 2-5 identify the location of these properties within the project corridor.

TABLE 2

CULTURAL RESOURCES WITHIN PROJECT AREA OF POTENTIAL EFFECT

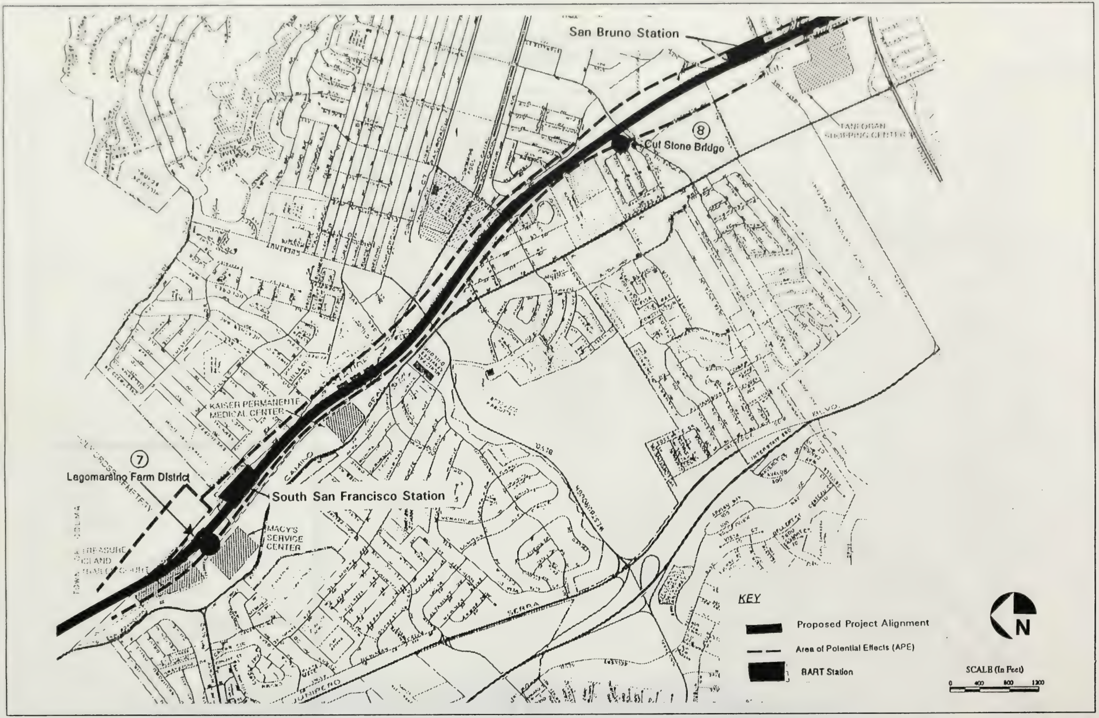
PROPERTY LOCATION	MAP I.D. NO.
CEMETERY DISTRICTS	
Italian Cemetery 540 F Street, Colma	1
Home of Peace/Hills of Eternity Memorial Park 1299 El Camino Real, Colma	2
Cypress Lawn Memorial Park 1370 El Camino Real, Colma	3
Holy Cross Cemetery 1500 Mission Rd, Colma	4
Salem Memorial Office Building 1171 El Camino Real, Colma	5
Old Colma Railroad Station at northeast corner of Serramonte Boulevard and El Camino Real, Colma	6
Lagomarsino Farm District/Residences 1431-1457 Mission Road, Colma	7
Cut Stone Bridge at South Spruce Street and Southern Pacific Railroad Line, South San Francisco	8
540 San Antonio Blvd, Millbrae	9
Millbrae Train Station 21 East Millbrae Avenue, Millbrae	10



Significant Historic Recources
Adjacent to Project (North)

FIGURE

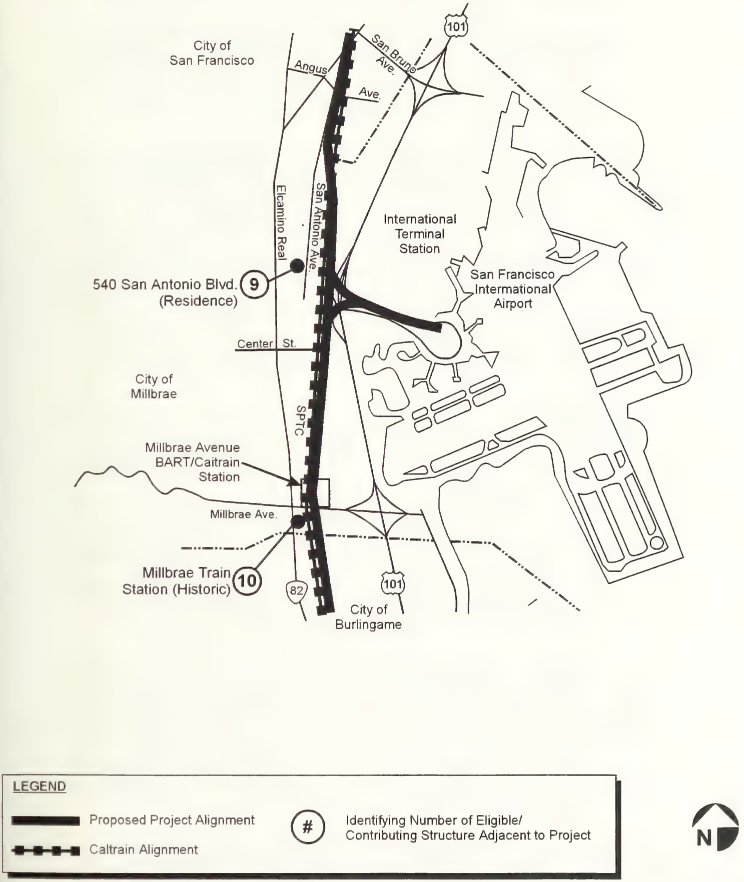
2-3



Significant Historic Resources Adjacent to Project (Central)

FIGURE

2-4


City of San Francisco
Angus Ave.
San Bruno Ave.
101
Elcamino Real
San Antonio Ave.
International Terminal Station
San Francisco International Airport
540 San Antonio Blvd. (Residence)
9
Center St.
City of Millbrae
SPTC
Millbrae Avenue BART/Caltrain Station
Millbrae Ave.
Millbrae Train Station (Historic)
10
82
101
City of Burlingame
LEGEND
Proposed Project Alignment
Caltrain Alignment
#
Identifying Number of Eligible/ Contributing Structure Adjacent to Project
N

FIGURE

2-5

Significant Historic Resources
Adjacent to Project (South)

C. Public Participation

Regional agencies have been planning and coordinating public participation for the proposed BART-SFO project since 1972. Over 100 alignments with various transportation modes and alignments have been considered since 1972, with the goal of serving the San Francisco peninsula as well as the San Francisco International Airport. A brief summary of the environmental and public participation processes follow.

Alternatives Analysis/Draft Environmental Impact Report/Draft Environmental Impact Statement (AA/DEIR/DEIS): The Metropolitan Transportation Commission (MTC) and FTA prepared an AA/DEIR/DEIS for the corridor in 1992. The AA/DEIR/DEIS included four BART build alternatives developed from previous planning efforts. The project alternatives and environmental analysis, including potential impacts to resources, were circulated to the public. MTC held scoping meetings prior to development of this document and upon its public release. Properties now deemed eligible for the National Register that were included in the APE for the AA/DEIR/DEIS alternatives which remain in the APE for the LPA are: the Lagomarsino Farm District, the cut stone bridge, the 540 San Antonio residence and the four cemetery districts: Italian, Home of Peace/Hills of Eternity, Cypress Lawn Memorial Park, and Holy Cross.

Draft EIR/Supplemental Draft EIS (DEIR/SDEIS): After MTC completed the AA/DEIR/DEIS, BART, SamTrans and FTA became the lead agencies for the project. These agencies decided not to prepare a Final EIS/Final EIR but instead prepared a DEIR for recirculation to study new alternatives that warranted consideration. This document analyzed potential impacts to the historic properties for each of several project alternatives. It included all of the properties discussed in this report except the residence at 540 San Antonio Boulevard (which was not in the project APE at that time). During preparation of this second environmental document, BART, SamTrans and FTA provided the public with general updates on the proposed project through periodic newsletters, and opened a community service center to the public in late 1994 where staff were made available to address the public's questions and issues.

In early 1995, BART, SamTrans, and the FTA released a Draft EIR/Supplemental Draft EIS to the public for a 60-day comment period. Approximately 440 agencies, organizations, and individuals received copies, and the report was also made available at all libraries and city halls within the project corridor. One hundred and fifty persons testified at three public hearings held in February and March of 1995. By the conclusion of the public comment period in mid-March 1995, about 2,300 discrete written and verbal comments had been received from 283 different organizations and individuals. Many of these comments addressed cultural resources.

Focused Recirculated DEIR/Supplemental #2 DEIS (FRDEIR/S#2DEIS): In September 1995, FTA, BART, and SamTrans released a FRDEIR/S#2DEIS to analyze an additional aerial design option for airport access. This option did not alter the potential effect to the historic properties identified in DEIR/SDEIS. However, within the APE for this design option, an additional historic property was identified: the residence at 540 San Antonio Blvd. As the aerial design option would introduce a new element in the vicinity of this structure (i.e., a soundwall), it was included in the document but not considered to be a significant impact or adverse effect. A public hearing was held on this design option and public comment was recieved, including several comments on potential movement of the Millbrae Train Station.

Potential temporary and permanent effects to historic properties were discussed in Sections 4 (Cultural Resources) and 13 (Construction Impacts) of Chapter 3 in the DEIR/SDEIS and FRDEIR/S#2DEIS. This initial assessment for the DEIS/SDEIS was made prior to advances in project design and assumed wider right-of-way needs and construction easements. Since that time, the LPA has been selected and significant progress has been made on refining the project definition and construction scenario. Also, public comment on the environmental documents has included information used to reassess project effects. In one case, a potentially adverse effect to a significant property was avoided. Consultation with local agencies and advanced preliminary project engineering resulted in a project design which avoids the need to move the Millbrae Train Station. The results of these consultations and responses to comments on the 1995 environmental documents will be included in the Final EIR/Final EIS, scheduled for release before the summer of 1996.

In addition to the consultation outlined above in association with the NEPA and CEQA processes, BART and SamTrans staff coordinated directly with parties concerned with specific cultural resources as follows:

. Since Summer 1993, necessary contacts with Native Americans--most likely descendants and interested parties--have been maintained (See Correspondence Section, Appendix C).

. Since 1993, BART staff has been coordinating with the cemetery districts to generate pre-construction agreements on the best plans and practices for BART construction through these sensitive areas.

. For the two resources for which the DEIR/SDEIS identified a direct significant impact (Millbrae Train Station and cut stone bridge), BART coordinated with the cultural commissions, property owners, local agencies, and other agencies which would have possibly been party to an Memorandum of Agreement as part of the Section 106 process.

D. Determination of Effect in this Study

36 CFR Part 800.9 discusses the criterion used to determine whether an undertaking has an "effect" or an "adverse effect" on the historic property. The following criterion is used to determine an "effect":

> "An undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of a property's location, setting, or use may be relevant depending on a property's significant characteristics and should be considered". (36 CFR $800.9 (a))

The following criteria are used to determine an "adverse effect":

> "An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:
>
> 1. Physical destruction, damage, or alteration of all or part of the property;
> 2. Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
> 3. Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
> 4. Neglect of a property resulting in its deterioration or destruction; and
> 5. Transfer, lease, or sale of the property". (36 CFR $800.9 (b))

Sections 3 through 10 of this report apply these criteria to each of the ten historic properties, providing three subsections for each:

A. A description of the property and its NRHP status and significance, summarizing research performed for the HRER and HASR. These descriptions contain a summary of the basis for the determination of eligibility.

B. A description of the effect of the undertaking on the property. This subsection places the resources in the project context, based on current engineering. Photographs and project engineering maps are used in several sections to illustrate impacts.

C. Application of the criteria of effect.

III. CEMETERY DISTRICTS

This section references the Historic Resources Evaluation Report (HRER) of Seven Colma Cemeteries, summarizing the features which make the cemetery districts eligible for the NRHP. The section highlights key resources which contribute to the cemetery districts which are adjacent to the project right-of-way and, for reference, uses the same base maps and property numbering system that was used in the HRER.

A. Description of Eligible Properties

Italian Cemetery: This cemetery, founded in 1899, clearly embodies the distinctive aesthetic principles and values of the southern European cemetery design in its plan (rectilinear, grid), buildings, minimal natural plantings, materials, funerary sculpture, grave markers, underground vaults, and mausoleums. This property meets Criterion C of the NRHP significance criteria for architectural merit. Its integrity is good despite nearby development. It is, therefore, an authentic historical property and meets the special cemetery criteria considerations for the National Register.

Home of Peace Cemetery and Hills of Eternity Memorial Park: These cemeteries abut one another, were developed in tandem, and thus form one district with historic and visual unity. This district qualifies under Criteria B and C of the National Register significance criteria. Both cemeteries, and in particular the Home of Peace Cemetery, contain the graves of persons exceptionally significant in California's history. For example, banker I.W. Hellman, clothier Levi Strauss, the leading members of the Lilienthal, Zellerbach, Haas, Sachs, Fleishhacker, and the Shilling families and Lawman Wyatt Earp are buried here. This district also represents an excellent example of cemetery design during the period 1889-1945. It shows both the influence of the traditional rectilinear cemetery design and the picturesque curvilinear design and natural landscaping of the more modern rural cemetery style. It therefore embodies the distinctive characteristics of design for both these types of cemeteries. This district also has excellent integrity of location, materials, workmanship, feeling, and association. Its integrity of design is only good, due to the loss of a monumental arched gateway and chapel during the 1906 earthquake. Its integrity of setting has been somewhat compromised by nearby developments and so also is only good. Notwithstanding some minor loss of integrity, this district is clearly an authentic historical property and meets the special criteria consideration for the National Register.

Cypress Lawn Memorial Park: This cemetery qualifies for the National Register as a state-level district. For a number of reasons, it is the most important of all the cemeteries evaluated for this study. First, it contains the finest collection of funerary art and architecture found in Northern California. Second, even though it does not present a completely unified image, it is the fullest realization of the picturesque landscaping principles of the rural cemetery movement to be found in any of the Colma cemeteries. It therefore is one unified entity--a district. Third, it reflects the evolution of American cemetery design from 1892 through the World War II era (its period of significance). Finally, no other cemetery in Northern California (and perhaps the entire state) contains the remains of so many people who played outstanding roles in the economic, political, intellectual, and artistic history of the state. This cemetery therefore qualifies for the National Register under Criteria B and C, due to its association with important people (such as historian Hubert Howe Bancroft; authors Gertrude Atherton and Lincoln Steffens; architect John McLaren; bankers William C. Ralston, William H. Crocker, and Lloyd Tevis; newspapermen William Randolph Hearst and Charles De Young; mine owner and Senator George Hearst; philanthropist Phoebe Apperson Hearst; ship owner William Matson; mine owner James C. Flood; sugar magnate Rudolph Spreckels; Governor and Senator Hiram W. Johnson; and pioneer Thomas O. Larkin) and architectural and design values. It is an excellent example of the rural cemetery theme, has excellent integrity of location, setting, design, materials, workmanship, feeling, and association, and meets the special criteria consideration for the National Register.

Holy Cross Cemetery This cemetery qualifies for the National Register as a state-level district. As was the case for the Home of Peace/Hills of Eternity district, it represents a combination of the traditional and modern cemetery styles, illustrating the evolution of these styles. This district qualifies under Criteria B and C. It contains the graves of persons exceptionally significant in California's economic and political history (Governor John G. Downey, A.P. Giannini of the Bank of America, Mayor and Senator James D. Phelan, and "Silver King" and Senator James G. Fair) and is an excellent example of cemetery design for the period 1886-1945. It has a fine collection of historic buildings, gravemarkers, and mausoleums. It illustrates both the influence of the traditional rectilinear cemetery design and the picturesque curvilinear design, and natural landscaping of the more modern rural cemetery style. It therefore embodies the distinctive characteristics of design for both these types of cemeteries. This district also has excellent integrity of location, setting, design, workmanship, materials, feeling, and association. It is therefore an authentic historical property and meets the special criteria consideration for the National Register.

B. Description of Effect of Undertaking on Eligible Properties

In the area of historic cemeteries, the proposed BART-SFO extension would traverse along the former SPTCo. right-of-way, which was used until the mid-1900's as an active railroad line. Currently, the former right-of-way is evidenced by a continuous approximate 60' vacant swath through the cemeteries. Some portions of this right-of-way are now owned by the cemeteries while others are still owned by the SPTCo. Ownership of some of the former right-of-way has also been transferred to the adjacent cemeteries. SamTrans will purchase most of this former right-of-way which traverses through the west side of the Italian, Home of Peace, Hills of Eternity, Cypress Lawn and the Holy Cross Cemeteries along with adjacent strips of cemetery property. The proposed BART-SFO extension would be built in a concrete box subway, with the top of the box located approximately 10 to 15 feet below the surface, in order to accommodate utilities and landscaping. In addition to the right-of-way acquisitions, temporary subsurface construction easements would be needed which would extend up to 50 feet on each side of the right-of-way. No grave sites would be located within this construction easement. Construction access easements would generally follow existing roads. After construction, the surface would be restored and the subway would not be visible. The construction time through these districts is estimated to be no more than one year at any one area.

No permanent or long term impacts to historic setting or structures in the district are anticipated, as the final project would be underground. Though the proposed project would create temporary construction effects such as dust, truck movement, noise, vibration, and some visual and other nuisances within the cemetery districts, there would be no removal of the more aesthetic landscaping in areas intentionally included in cemeteries for contemplative activity. Moreover, any landscaping removed for construction would be replaced. The majority of the vegetation required for removal would be unattended trees and brush in portions of the cemetery properties used for storage, maintenance, staging of construction work, and commercial business leases. A minimal amount of more aesthetic landscaping, as indicated specifically in the following subsections, will be removed.

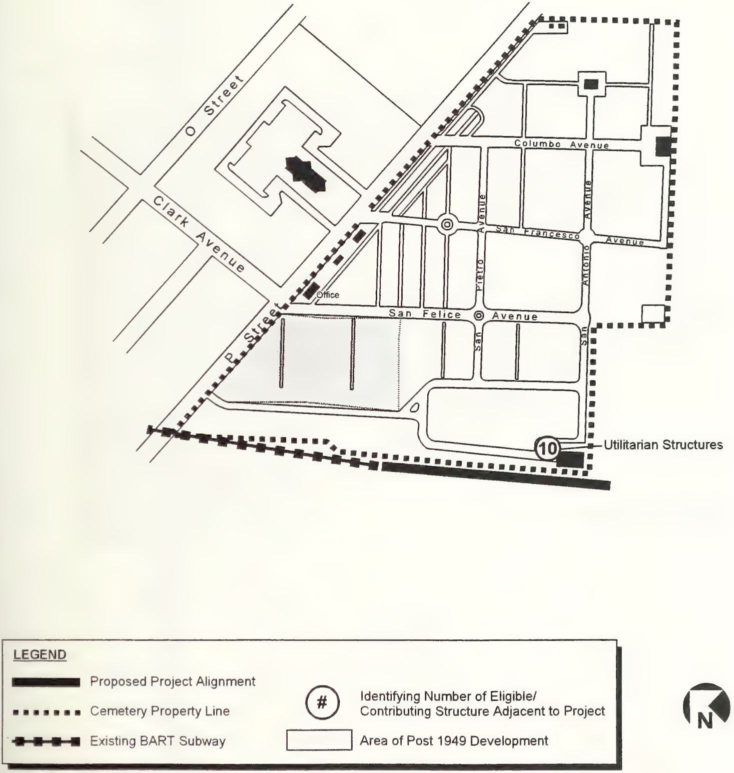
During construction, less than half the construction area would be visible from the adjacent street (El Camino Real Blvd.) or active cemetery areas. Particularly for the Italian, Home of Peace and Holy Cross Cemeteries, the BART construction area would be shielded from burial sites and active cemetery uses by an adjacent embankment. Subsurface easement lines run close to and under some structures which contribute to the historic nature of the Italian, Home of Peace/Hills of Eternity, Cypress Lawn and Holy Cross cemeteries. Therefore some construction would come close to these structures, as indicated in the following sections. Measures would be taken to ensure that no effects on these structures occur.

The following summarizes the undertaking in the context of each historic cemetery district. Identified are general characteristics of the project right-of-way and cemetery features (considered to be contributing elements to the historic district in the HRER) which are adjacent to construction. Site maps, property numbers, and documentation on the contributing structures are taken from the HRER.

The Italian Cemetery Figure 3-1 identifies the proposed alignment adjacent to the Italian Cemetery and Figure 3-2 provides background on the only contributing structures directly adjacent to right-of-way in this cemetery. Figure 3-3 shows the proposed construction easement in relation to cemetery resources. This route abuts Eternal Home Cemetery to the west; Eternal Home Cemetery was not one of the cemeteries which qualified as a historic district.

The right-of-way from the end of the existing Colma track would continue to traverse for no more than 500 feet adjacent to a burial area in Eternal Homes cemetery and through some open grassy area adjacent to the Italian Cemetery and visible to the street. Some adjacent eucalyptus and cypress trees in the Eternal Home Cemetery would be removed.

Previous BART extension construction was performed in the Italian Cemetery for development of the tailtrack for the Colma Station. Note that construction for the tailtrack occurred as close as 10-15 feet from some grave sites in the Eternal Homes Cemetery and within that same distance from one non-contributing community mausoleum in the Italian Cemetery. Construction was successfully completed with no damage to the structures or existing resources, illustrating the ability to build within a limited construction easement and use of subsurface tiebacks to secure the ground underneath structures during construction (See Figure 3-4 for photographs).

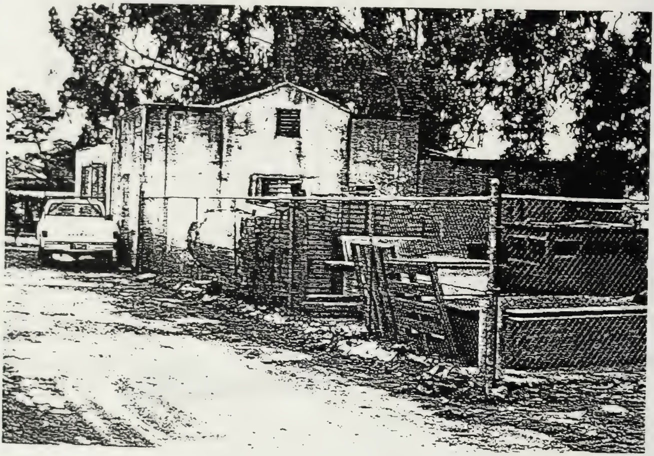


Italian Cemetery
Site Map

FIGURE
3-1

#10
Italian Cemetery: Utilitarian Structures

This complex of four, small buildings defines a courtyard. They are all wood-framed, stucco-clad structures, all probably set on concrete foundations and have generally been greatly altered. The oldest (ca 1930) and the only contributing structure has a gable roof partially enclosed by parapets. Walls have corner piers and simple cornices. Windows vary; original ones appear to have been industrial type with metal sash. Other details include louvered-wood vents.

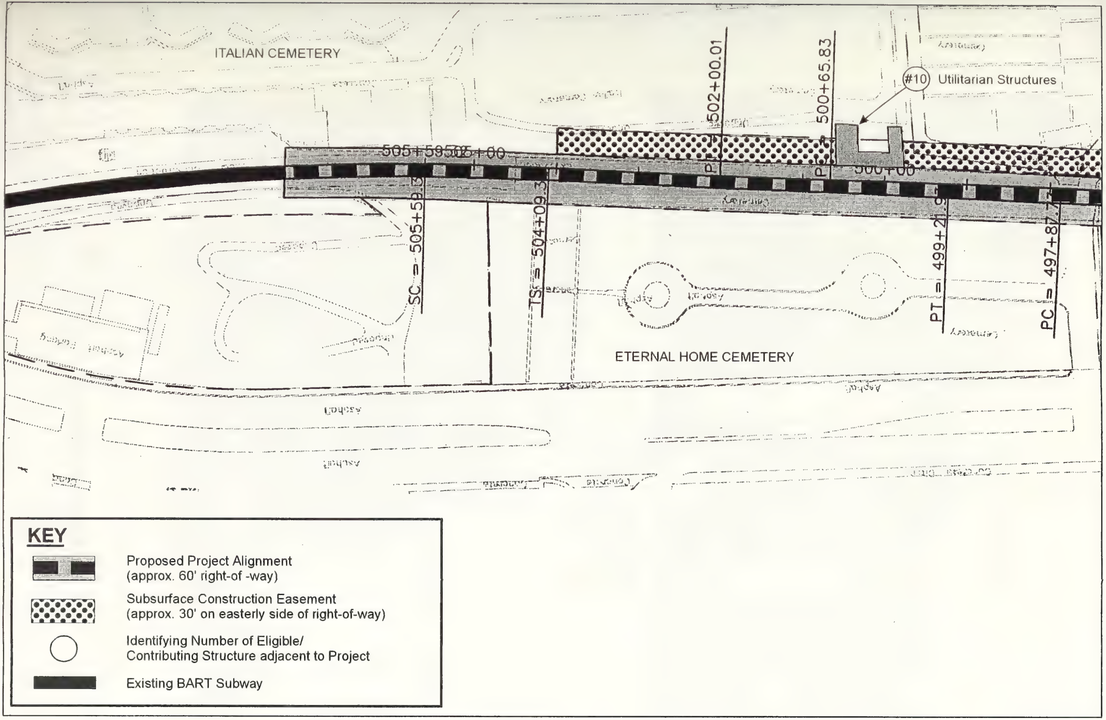


Source: Historic Resource Evaluation Report

Description of Utilitarian Structures

FIGURE

3-2


ITALIAN CEMETERY
ETERNAL HOME CEMETERY
#10 Utilitarian Structures
SC = 505+59.3
505+00
TS = 504+09.3
502+00.01
500+65.83
500+00
PT = 499+21.9
PC = 497+87.7
KEY
Proposed Project Alignment (approx. 60' right-of -way)
Subsurface Construction Easement (approx. 30' on easterly side of right-of-way)
Identifying Number of Eligible/ Contributing Structure adjacent to Project
Existing BART Subway

BART
Construction Easement
in Italian Cemetery

FIGURE

3-3

View of existing BART tracks adjacent to community mausoleum in Italian Cemetery and Eternal Home Cemetery graveyard area, looking north. Project will extend from these tracks

View of open area in cemetery. Some trees will be removed in this area

Photo Views in Italian Cemetery

FIGURE

3-4

Home of Peace/Hills of Eternity Figure 3-5 illustrates the alignment through the Home of Peace/Hills of Eternity district. As can be seen on the site map, the vast majority of the cemetery is located northeast of the right-of-way. Figure 3-6 provides some illustration of the isolated, heavily vegetated areas where the project right-of-way would be located. Generally, the right-of-way is adjacent to several utility structures and non-contributing buildings, which are secluded and generally not visible to cemetery users. Figure 3-7 illustrates the construction easement in relation to contributing features of the cemeteries. The BART right-of-way and construction easement would be located directly adjacent to three structures considered to contribute to the historic nature of this district. Figures 3-8, 3-9 and 3-10 provide background information on these structures.

The greenhouses (Property #11) and the "pump house" (Property #20), utilitarian structures used for commercial and internal service uses but which contribute to the District's eligibility, are located adjacent to the construction easement and therefore are noted here. The greenhouse is located beyond the construction easement and therefore no potential impacts are anticipated. The pumphouse is located within the construction easement and as such, could require underpinnings for support, braces to prevent settling by shoring soil beneath the building, or other construction techniques as protective measures.

Property #12, Portals of Eternity, is a mausoleum within the Hills of Eternity Cemetery, is also a contributing structure to the district. Note that BART construction would require a subsurface easement that could require construction 10-15 feet from the base of the mausoleum on the west side. The project right-of-way would traverse on the west side of the building which is not clearly visible to or incorporated into the active uses of the cemetery. Construction activities would be away from the north-facing entrance of the mausoleum; public use of the mausoleum could continue during construction. The proximity of construction near the mausoleum would create temporary noise and other nuisances. Similar to the pumphouse, the structure could require underpinnings for support, braces to prevent settling by shoring soil beneath the building, or other construction techniques as protective measures. The most appropriate protective measures would be undertaken.

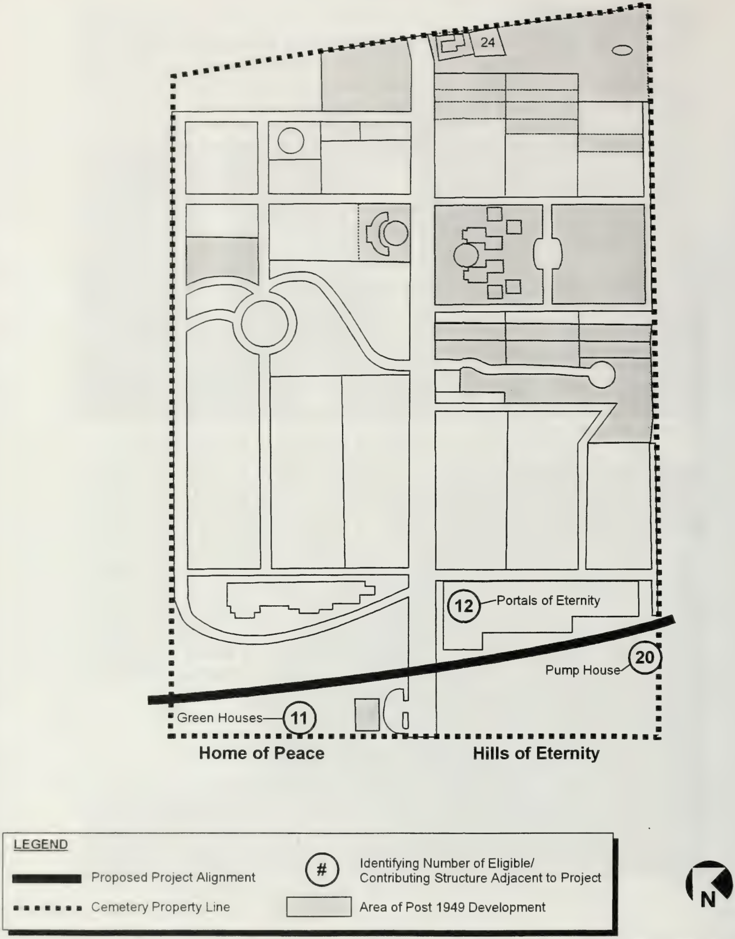

24
12
Portals of Eternity
20
Pump House
Green Houses
11
Home of Peace
Hills of Eternity
LEGEND
Proposed Project Alignment
Cemetery Property Line
#
Identifying Number of Eligible/ Contributing Structure Adjacent to Project
Area of Post 1949 Development
N

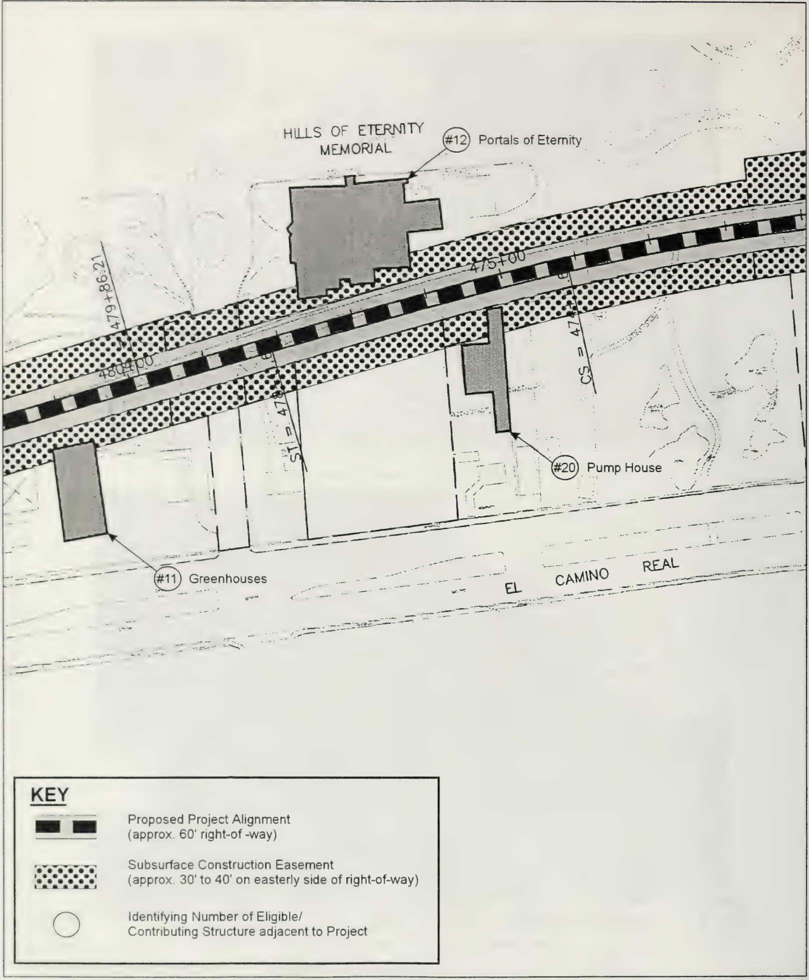
FIGURE 3-5

Home of Peace / Hills of Eternity Cemeteries
Site Map

View of right-of-way within Home of Peace Cemetery

Right-of-way adjacent to Portals of Eternity within the Hills of Eternity Cemetery

Photo Views in Home of Peace/Hills of Eternity Cemeteries

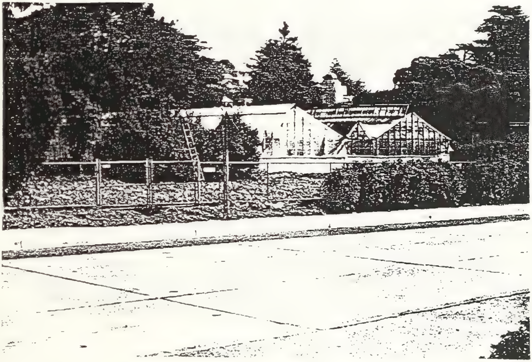

HILLS OF ETERNITY MEMORIAL
#12 Portals of Eternity
479+86.21
480+00
475+00
ST = 47
CS = 47
#20 Pump House
#11 Greenhouses
EL CAMINO REAL
KEY
Proposed Project Alignment (approx. 60' right-of -way)
Subsurface Construction Easement (approx. 30' to 40' on easterly side of right-of-way)
Identifying Number of Eligible/ Contributing Structure adjacent to Project

BART
Construction Easement
Home of Peace/Hill of Eternity Cemeteries

FIGURE
3-7

#11
Home of Peace: Greenhouses, ca. 1933.

This one-story, utilitarian building, erected in the early 1930s, has a wood-and-metal frame resting on concrete footings. The parallel gable roofs are covered in corrugated plastica. The waits are earth-bearing and clad in chamfered wood siding. Awning-type windows have wood sash. An attached, one-story shed has a wood frame resting on a concrete foundation. The shed roof of this attached structure is covered with tar paper. Sliding barn doors are made out of wood. Double-hung windows have wood sash. Although somewhat deteriorated, this utilitarian building contributes to the historic district for its historic association (it provided flowers for grave sites) with the landscape history of the cemetery.



Source: Historic Resource Evaluation Report

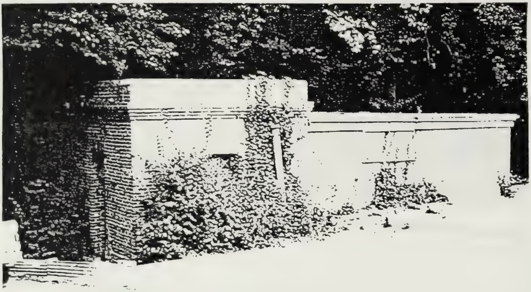
FIGURE

3-8

Description of Greenhouses

#20 Hills of Eternity Cemetery: "Pump House", ca. 1910.

This small utilitarian building is located at the southwest corner of the site, next to what was the original gate of the cemetery, and close to the Southern Pacific right-of-way. The plan is rectangular and the roof is flat. Walls are made of red brick, somewhat crudely laid, with projections suggesting a base and cornice and a concrete tie beam. It appears that the brick was meant to be covered in stucco. Windows were wood, with two remaining examples having X-shaped wood sash There is a new attached shed in concrete block with a flat roof. In spite of the name, there is no evidence that the building ever housed any mechanical equipment, and was more likely designed as a gate house. This structure is a contributing element of the historic district.



Source: Historic Resource Evaluation Report

FIGURE

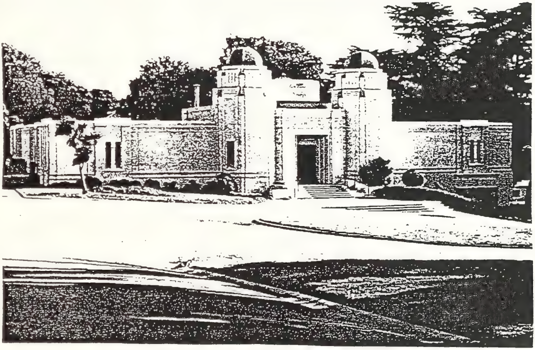
Description of Pump House

3-9

#12

Hills of Eternity: Portals of Eternity. Architect: Wallace A. Stephen.
Original Builder: Abraham Hyman and Samuel Appleton. 1933-34, with numerous additions through the post-war period. (successor firms - Hyman, Appleton & Wolfard and then Appleton & Wolfard)

This one-story, reinforced-concrete building on a concrete foundation serves as both a mausoleum and columbarium. The front of the building is set parallel to the grade, exposing an extensive basement burial area on the downhill side. The color scheme is pink. The plan is branching and irregular, as is typical of such structures, but the front is symmetrical, with a central, recessed entry flanked by two octagonal, stepped towers capped by octagonal, tiled domes. An octagonal drum on axis with the entry marks the location of a rotunda inside. Two long walls extend from either side of this composition, broken only by slightly projected pavilions containing paired windows. The main doors are bronze with glazing and bronze grilles. A frieze above the entry bears Jewish symbols in relief, as does a second frieze above the basement entry. The interior is faced in travertine, with stained glass skylights over the galleries. The rotunda has a marble mosaic floor and is also enclosed by a skylight. This space leads to a rectangular chapel with a chancel, faced in marble, with carved wood pews and stained glass windows and skylight. This impressive design incorporates the Byzantine Revival forms popular for Jewish structures, reinterpreted through the simplified Moderne esthetic of the 1930s and 40s. The later additions have matched the original aesthetic or the exterior. This building is a contributing element of the historic district.



Source: Historic Resource Evaluation Report

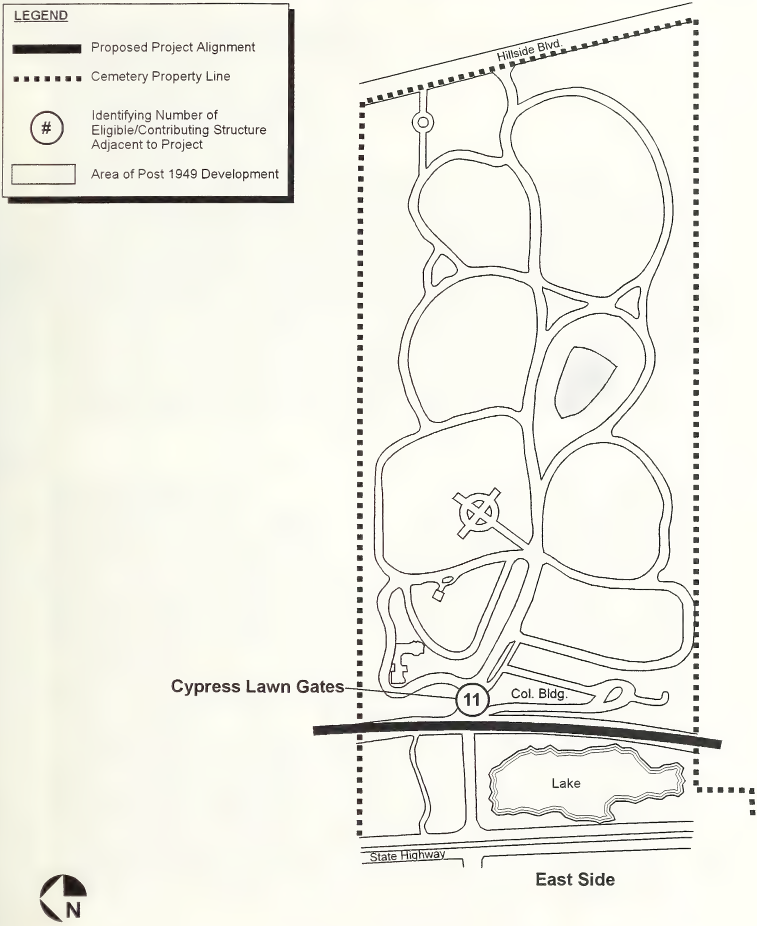
FIGURE 3-10

Description of Portals of Eternity

Cypress Lawn Memorial Park The right-of-way continues out of a tree-covered area into an open area within Cypress Lawn Cemetery. Figures 3-11 and 3-12 illustrate the project alignment through the cemetery on site maps. Figure 3-13 provides photographs of the right-of-way area. A few of the cypress trees located within the right-of-way shown in the foreground of the first photograph would be removed, and construction would be in an open area visible to the street. These are temporary construction impacts. Vegetation removed for construction will be replaced after construction is complete.

The contributing feature in this stretch is the Mission Road Gate, also referred to as the Cypress Lawn Gate. This gate was the original entry to the eastern section of the cemetery (1892) and is a significant historical and architectural feature of the cemetery. Figure 3-14 provides background information on the Cypress Lawn Gate. The BART right-of-way would be located approximately 30 feet from the gate. From this distance and using best construction practices, no damage to the gate is anticipated. As an added precaution, instrumentation would be used to monitor the gate for potential settlement or potentially damaging vibration as construction advances. Monitoring will indicate the need to provide additional support to the structure or to alter construction techniques adjacent to the structure. The most appropriate form of tiebacks and shoring of the structure would be included in construction as a preventative measure. Mature Monterey cypress trees which form a short arc on either side of the gate would not be removed.

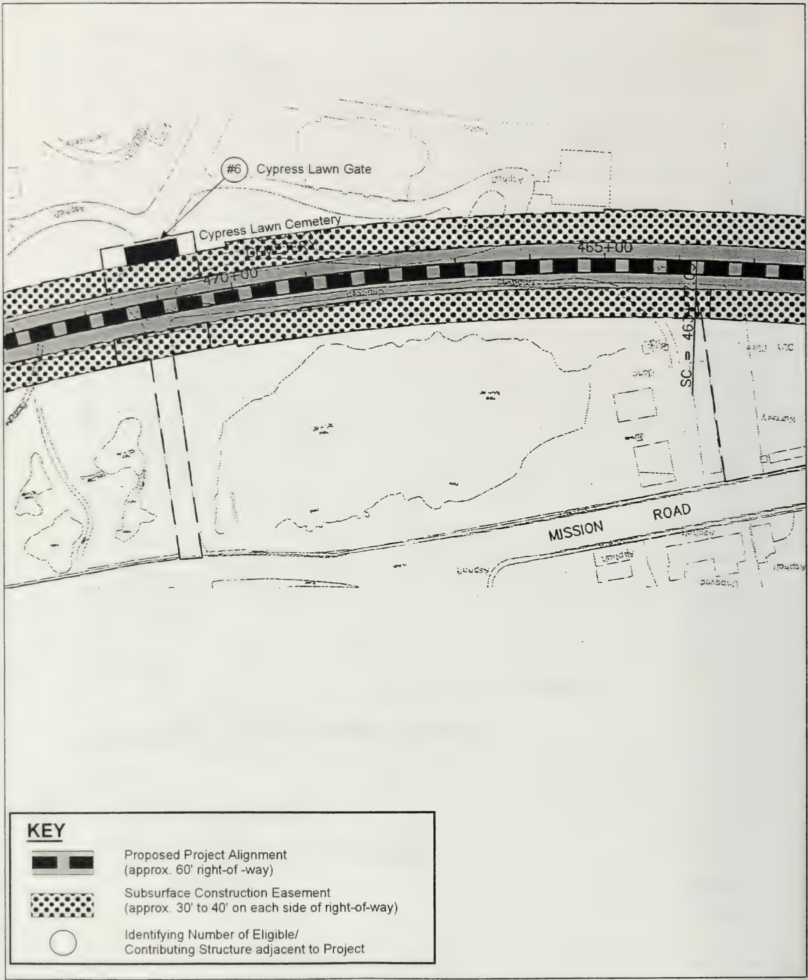
Continuing south, the right of way is bounded by dense brush to the east. To the west, some construction would be visible to the street and surrounding open area, including a small pond. The pond area is not identified as a contributing historic feature, nevertheless construction is not anticipated to affect the pond or the adjacent public area.


LEGEND
Proposed Project Alignment
Cemetery Property Line
#
Identifying Number of Eligible/Contributing Structure Adjacent to Project
Area of Post 1949 Development
Hillside Blvd.
Cypress Lawn Gates
11
Col. Bldg.
Lake
State Highway
East Side
N

Cypress Lawn Cemetery (East)
Site Map

FIGURE

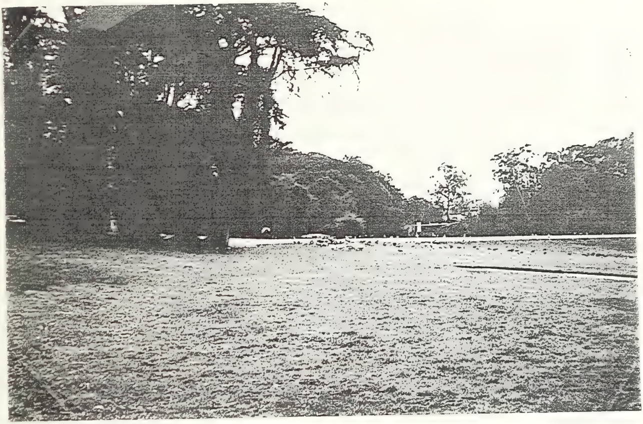
3-11


#6
Cypress Lawn Gate
Cypress Lawn Cemetery
465+00
470+00
SC = 46
MISSION ROAD
KEY
Proposed Project Alignment (approx. 60' right-of -way)
Subsurface Construction Easement (approx. 30' to 40' on each side of right-of-way)
Identifying Number of Eligible/ Contributing Structure adjacent to Project

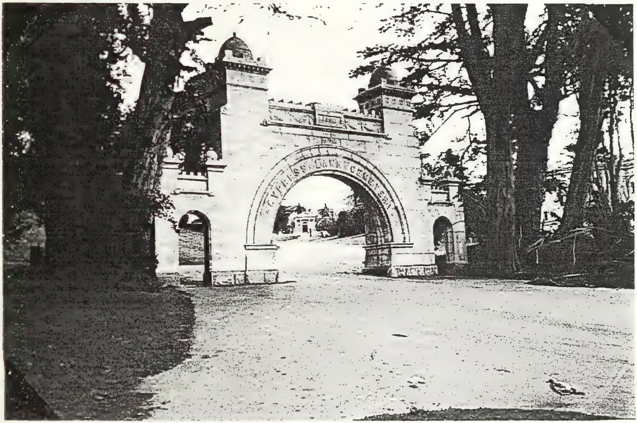
FIGURE

3-12

BART
Construction Easement
in Cypress Lawn Cemetery



Open area for BART right-of-way, north of Cypress Lawn, looking south



View of gate from project right-of-way, looking east, Cypress trees directly adjectent to the gate would not be removed

FIGURE

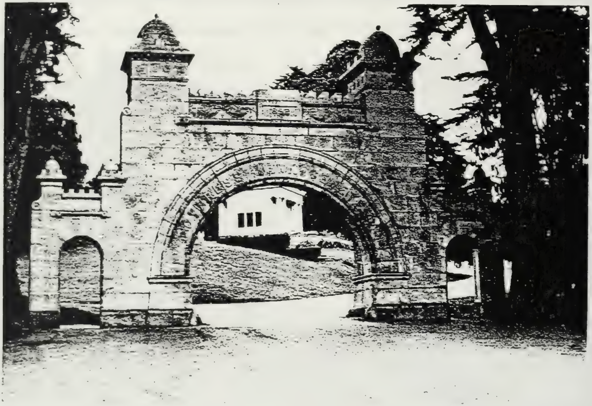
3-13

Photo Views in Cypress Lawn Cemetery

#6

Cypress Lawn Memorial Park: Mission Road Gate, 1892.
Designer: Barnett McDougal & Son, San Francisco.

The original entry to the eastern section of Cypress Lawn is a three-part granite gateway, smooth-faced on the side facing El Camino Real, and rock-faced on the side facing the cemetery The significance of the different finishes is intriguing but unresolved. The larger central part consists of a low-sprung, Syrian arch bearing the name of the cemetery in raised letters. A crenellated frieze with swags and fragments of a Greek fret separates two short square towers. These terminate in a crenellated battlement containing a pointed chattri-like dome. Two smaller arched doorways with a similar design flank the central part on either side. Citing an article in an April 1892 issue of the *San Mateo Times Gazette,* the Colma Historic Resources Survey describes this gateway as "one of the earliest extant examples of the Mission Revival style of architecture in California " In fact, this eclectic design, combining aspects of the Richardsonian Romanesque and medieval building, bears little real resemblance to any of the Renaissance-inspired architecture of the California missions, although it is a witty and sophisticated complement to the fortified towers on Hillside Boulevard. The gate is flanked by mature Monterey cypresses. This building is included on the municipal inventory of historic sites and is a contributing element of the historic districts.



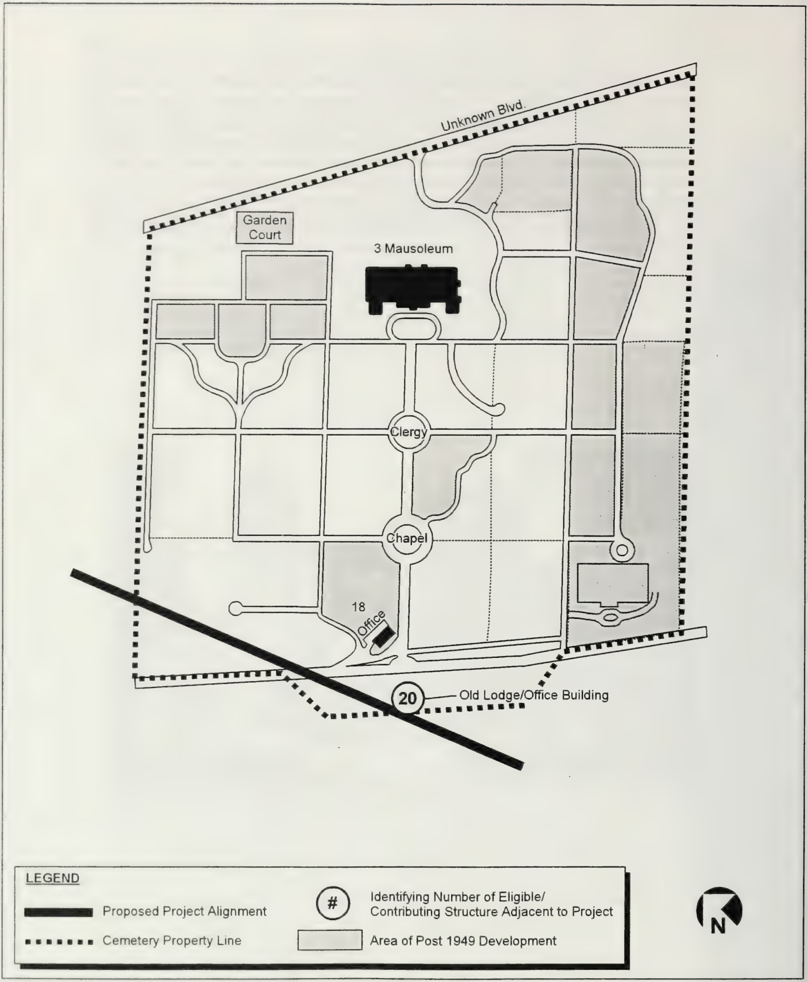
Source: Historic Resource Evaluation Report

Description of Cypress Lawn Gate

FIGURE

3-14

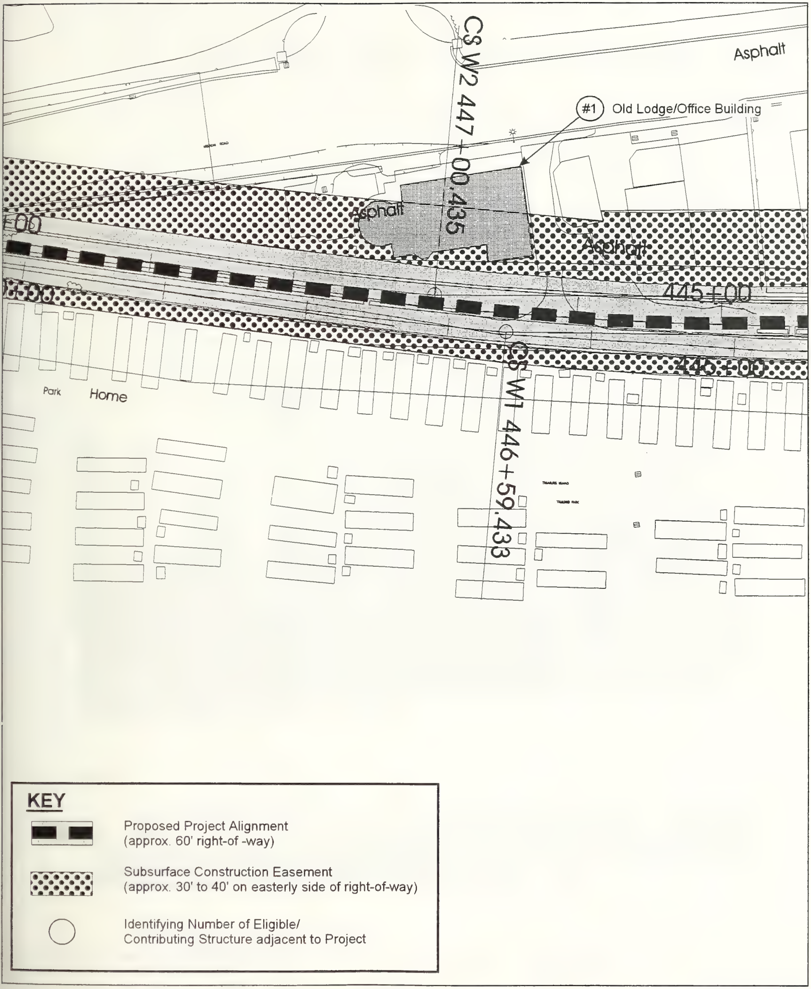
Holy Cross The BART right-of-way crosses the northwest corner of the cemetery in a mostly grassy open area. No cemetery or facilities are located in this area, as illustrated in the site map in Figure 3-15. After crossing Mission Road, BART subsurface construction would come within 15 feet of the Old Lodge/Office Building, considered a contributing part of the Holy Cross Cemetery district (See Figure 3-16). Background data on this property from the HRER is included in Figure 3-17. Similar to the Portals of Eternity mausoleum, it is possible that this structure would need additional subsurface supports during construction. Such support would be provided as appropriate.


Unknown Blvd.
Garden Court
3 Mausoleum
Clergy
Chapel
18
Office
20
Old Lodge/Office Building
LEGEND
Proposed Project Alignment
Cemetery Property Line
#
Identifying Number of Eligible/ Contributing Structure Adjacent to Project
Area of Post 1949 Development
N

FIGURE

3-15

Holy Cross Cemetery
Site Map


Asphalt
#1
Old Lodge/Office Building
CS W2 447+00.435
Asphalt
Asphalt
445+00
446+00
CS W1 446+59.433
Park
Home
KEY
Proposed Project Alignment
(approx. 60' right-of -way)
Subsurface Construction Easement
(approx. 30' to 40' on easterly side of right-of-way)
Identifying Number of Eligible/
Contributing Structure adjacent to Project

BART
Construction Easement
in Holy Cross Cemetery

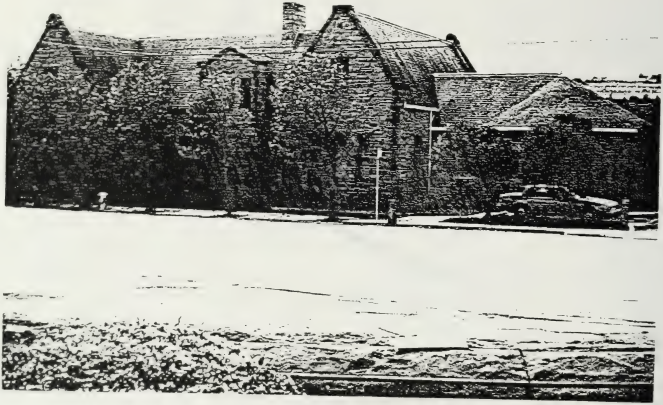
FIGURE

3-16

#1

Holy Cross Cemetery: Old Lodge/ Office Building, 1902 (1595 Mission Road). Designers: Frank and William Shea, who also constructed the cemetery gates across Mission Road.

This handsome structure is built in the Richardsonian mode of the Romanesque revival. It features an irregular plan; walls of random-coursed, rock-faced sandstone and a roof clad in slate The main body of the building features two, parallel, steeply-gabled sections facing the street, connected by another gable running perpendicular to the first two. Attached on the north side of this central section of the building is a circular wing with a conical roof. This last feature might have its origins in Richardson's library designs. On the east, west and south facades of the main structure can be found arcades with radiating voussoirs executed in the same rock-faced stone. Other details include: gabled wall dormers; buttresses; double-hung, wood-sash windows; tripartite windows; a stone chimney; and a stone coping at the eaves. The interior features molded door and window surrounds and paneled doors and wainscoting. The building was originally used for an office for the cemetery and as a passenger station for the railway and trolley lines that ran on either side of it. Caretaker's facilities were provided in the second story. A newspaper report of the period estimated the cost of the lodge at $15,000. This building is an excellent example of the Richardson Romanesque. In spite of the popularity of the style during the late-nineteenth century, relatively few examples survive in the state of California. Another Shea & Shea Romanesque revival building, St. Rose Catholic Church (1900) still survives in Santa Rosa, CA. The lodge is a contributing element of the historic district.



Source: Historic Resource Evaluation Report

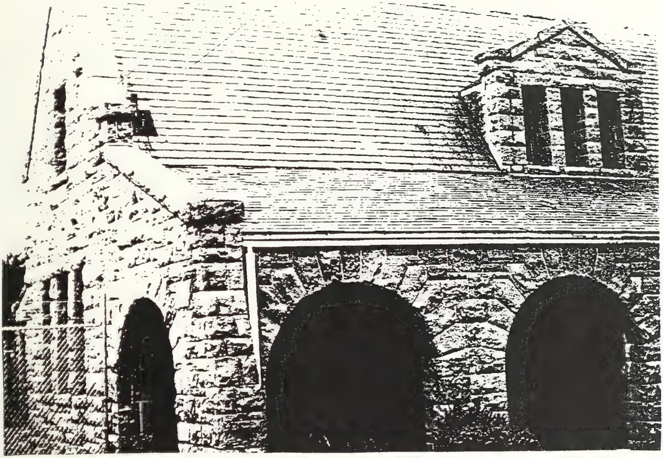
FIGURE

Description of Old Lodge/Office Building

3-17A

#1 Photo continuation page

Holy Cross Cemetery: Old Lodge/Office Building



Source: Historic Resource Evaluation Report

FIGURE

Description of Old Lodge/Office Building

3-17B

C. Application of the Criteria of Effect

Based on the discussion of the undertaking in the context of the eligible properties, and the application of criteria of effect, it has been determined that this undertaking would have no effect on the cemetery districts. Construction of the proposed project would create temporary impacts to some historic structures and some open public spaces within cemetery grounds, such as noise, dust and visual disruptions. As mentioned, landscaping removed by project construction would be replaced, both as a condition of the CEQA Mitigation Monitoring Plan and as a condition of construction agreements with the cemeteries.

Construction directly adjacent to the structures identified above would be below the surface and would take into account footings or other subsurface features of the structures. Construction techniques used to build adjacent to or underneath structures include: placing tiebacks to brace open earthen areas within an excavation, placing underpinning columns to support structures while excavating underneath, and providing shoring or braces to a structure above surface as additional support during construction activities which may cause earth movement or vibration. These are standard precautionary methods used to reinforce soils and structures near subsurface construction, and would be used if determined necessary in the final design and construction phase. Subsurface construction within 10-15 feet of structures is not an uncommon practice for BART construction, as illustrated along the Colma Station alignment and subsurface development of the original BART system.

All of the above are short term impacts that would not be harmful to those characteristics that qualify the properties for inclusion on the National Register. Because the project would be permanently located underground and restoration of the ground surface would occur after construction activities, no long term or significant alterations would occur to the setting of these cemeteries or the resources within them.

As mentioned previously, BART and SamTrans have committed to entering into pre-construction agreements, in which terms for activity in the right-of-way would be stipulated in a Memorandum of Understanding (MOU) among BART, SamTrans and each cemetery. Furthermore, construction scenarios would be coordinated between the contractors and property owners to ensure that construction activities will remain in designated areas. Agreements with the cemeteries would contain specific terms regulating activity in these sensitive areas, which may contain, as necessary:

- specifics on vegetation removal, use of access roads and other activities on site;
- fencing and other methods to shield accessible construction areas;
- engineering methods (previously mentioned) which can protect properties close to subsurface construction activities;
- instrumentation of adjacent sensitive structures to monitor effects of construction;
- protection methods to minimize dust from structures as required;

- restriction of construction activities to designated easements;
- landscaping, revegetation and restoration to the right-of-way to be undertaken by BART in coordination with the cemeteries

IV. SALEM MEMORIAL OFFICE BUILDING

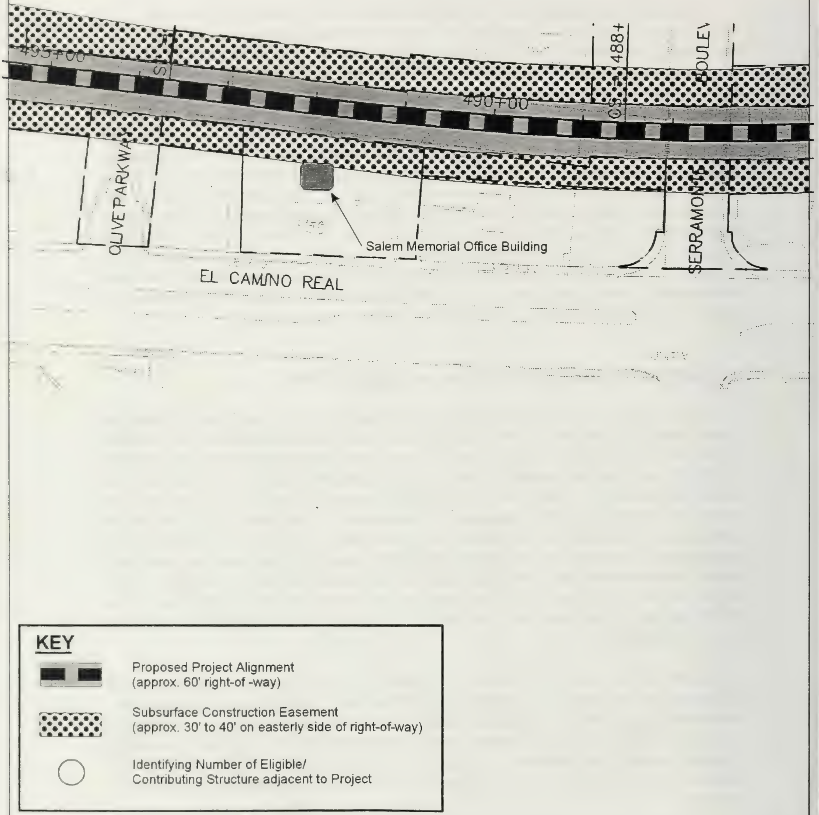
A. Description of Eligible Property

This Art Deco/Moderne building represents an excellent example of this style. It is one of the two (the other being a Hills of Eternity mausoleum previously discussed) finest examples of this style in Colma. The theme for this structure is architectural history, and it qualifies under Criteria A and C of the National Register. Regarding Criterion A, the events with which the building is associated are the continued development of the cemetery industry in Colma during the 1930's. The period of significance is thus the 1930's and the level of significance is local. Regarding Criterion C, the property is distinctive as an unusual example of an Art Deco/Moderne style building in Colma. In its plan, materials, proportions, and ornamentation it illustrates well the pattern of features common to this class of resources. It is a good example of its theme. It is not part of a larger district since the rest of Salem Memorial Park does not have the qualities necessary for it to be eligible for the National Register (see Laurence H. Shoup and Mark L. Brack with Nancy Fee and Bruno Giberti, A Historic Resources Evaluation Report of Seven Colma Cemeteries, November 1993). Finally, the integrity of location, design, setting, materials, workmanship, feeling, and association of the Salem Memorial Park Office Building are good. The building, therefore, represents an authentic historic resource.

B. Description of Effect of Undertaking on Eligible Property

Review of the construction scenario indicates that the edge of construction would be approximately 40 feet from the building. Figure 4-1 provides a schematic of the structure in the context of the right-of-way. Figure 4-2 provides a photograph of the structure from the HASR and another taken of the project right-of-way adjacent to the building. Construction would be visible from an open area, however, none of the project would be visible in the setting after subsurface construction is complete. No subsurface underpinnings or shoring are anticipated to be necessary to support this structure during construction. Exposure to dust, noise and possibly some vibration could be short term impacts due to construction. Mature palm trees are growing adjacent to the right-of-way and would need to be removed; these trees are not considered to be significant to the NRHP eligibility of the structure. Any vegetation removed as part of project construction would be replaced.

In addition, the Salem Memorial Park cemetery has made available the open space adjacent to this building for a construction laydown area. If utilized as a laydown area, construction equipment and materials would be stored next to the building. Construction activities would remain a safe distance from the structure and any additional precautions to reduce dust and other temporary nuisances would be undertaken. No permanent effects to the setting or the structure are anticipated as a result of storing materials adjacent to the building.


495+00
490+00
488+
OLIVE PARKWA
SERRAMONTE
BOULEV
EL CAMINO REAL
Salem Memorial Office Building
KEY
Proposed Project Alignment (approx. 60' right-of -way)
Subsurface Construction Easement (approx. 30' to 40' on easterly side of right-of-way)
Identifying Number of Eligible/ Contributing Structure adjacent to Project

BART
Construction Easement Adjacent
to Salem Memorial Office Building

FIGURE

4-1

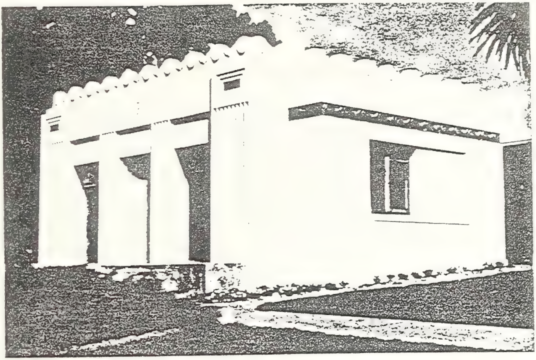
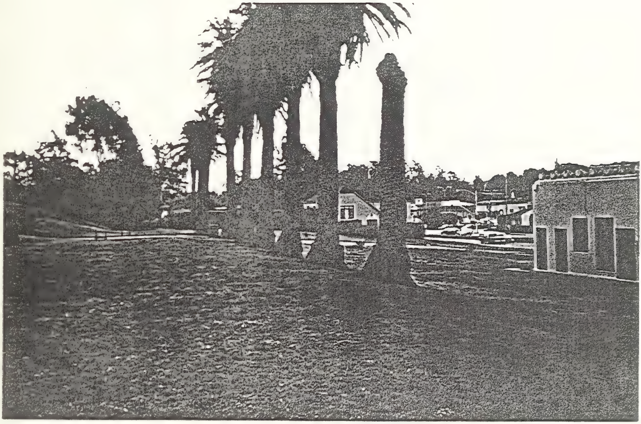


Photo of Salem Memorial Office Building as shown in Historic Evaluation Report



View of right-of-way through Salem Memorial Park, looking south. Office building is on the right. Palm trees would need to be removed but construction would be distant from building.

Photo Views of Salem Memorial Office Building and Right of Way through Salem Memorial Park

FIGURE

4-2

C. Application of the Criteria of Effect

Based on the application of the criteria of effect, this project would have no effect to the Salem structure. Because the project would be permanently located underground and restoration of adjacent grounds would occur after construction activities, it can be anticipated that no long term or significant alterations would occur to the building or its setting. Construction would create temporary impacts to the open space adjacent to the building. As with all construction in cemetery and other sensitive areas, protective and restorative measures would be included as part of good construction practice. BART activities in this cemetery would also be performed under an MOU as described in Section III.

V. OLD COLMA RAILROAD STATION

The Old Colma Railroad Station was originally located on the old Southern Pacific right-of-way east of the intersection of San Pedro Road and Washington Street. The Station has been moved twice by BART, most recently in 1993 to a temporary location at Serramonte Boulevard and El Camino Real; thus locating it within the APE for this project. The purpose of this move was to avoid possible damage from construction of the Colma BART Station. The Old Colma Railroad Station is significant as one of the last examples of an architectural style that was once popular for railroad stations throughout the State of California in the 1860s,'70s, '80s. Typical stylistic elements include the wooden board and batten construction and the wide overhanging eaves supported by curved woodbraces. It was determined eligible for the National Register in early 1981 under Criterion C (architectural merit), but was never formally nominated and listed.

In 1983, during BART construction of the Daly City Turnback, the building was moved, then returned to its original location in 1989. This temporary relocation was undertaken as part of a Memorandum of Agreement (MOA) between BART, the SHPO, and FTA (then called the Urban Mass Transit Authority). The SHPO subsequently in 1993 reaffirmed that the Station remained eligible for the National Register (BART, 1993). Subsequent historic investigation was completed in 1996 to confirm the station's eligibility as architecturally significant.

The current location for the Old Colma Railroad Station is a temporary avoidance measure for potential impacts from construction of the BART Colma station. As the BART Colma Station construction is almost complete, BART must remove the station from this temporary location. A Finding of Effect was prepared for a transfer of title and BART is entering into a MOA with the Town of Colma, the SHPO and the FTA which was the original funding agency for purchase of the station. Under the terms of this MOA, the station would be relocated from the BART-SFO project APE to a permanent location out of the APE.

This project would have no effect on the Colma Railroad Station as it is only temporarily located within the APE and would be moved per the MOA prior to construction.

VI. LAGOMARSINO FARM DISTRICT

A. Description of Eligible Property

This eligible district consists of six buildings related to the Frank Lagomarsino vegetable farm on Mission Road in Colma, five houses and one farm building. The row of houses that comprise the District face Mission Road as seen in Figure 6-1. This district was judged eligible for the National Register by Kent L. Seavey in his Historic Resources Inventory, City of Colma, California (1991). Seavey described the significance of this district as follows:

> The Frank Lagomarsino vegetable farm buildings along Mission Road constitute the largest and only remaining concentration of residential housing constructed in Colma between the San Francisco earthquake and the outbreak of WWI, an important period of growth in the region. They also constitute the most intact example of the family farmsteads that made up much of what is now Colma during the period of significance. Frank and Rosa Lagomarsino, both natives of the province of Genoa in Italy, purchased the farm about 1917. It had four existing structures to which Lagomarsino added his own home (1917) and four identical single-family residences (1918), one of which was given to his newly-married son Alfred (1931). Three of the original farm buildings were demolished when a warehouse was constructed at the south end of the complex in the 1980s, leaving only one building from the early period (1933). While the original farmland around them has been commercially developed, the six remaining Lagomarsino Neoclassic rowhouses retain their integrity as constructed by the New Era Building Co. to a remarkable degree (Seavey 1991).

B. Description of Effect of Undertaking on Eligible Property

The construction easement for the BART right-of-way would be located a minimum of 10 feet from the back of the property line. In comparison to the right-of-way, the property is elevated; the right of way is located at the foot of a slope. Even at the minimum 10 foot distance, there is sufficient area for construction activities to take place without having an effect on the Lagomarsino property itself. The structures which comprise this district are located 30 to 100 feet from the back property line, thus all structures are at least 40 feet away from BART construction activities. In general, no construction impacts to the structures from vibration or subsurface soil movement are anticipated. Exposure to noise and dust from construction would temporarily occur adjacent to this property.

After construction, there would be no visible sign of the undergrounded BART system. The existing setting behind the Lagomarsino property is vacant, open weedy fields with warehouse and flood control uses several hundred feet west, therefore construction activities behind the property would not create any aesthetic effects to the District.

Two of five houses which comprise the Lagomarsino Farm District on Mission Boulevard

View of back fenceline of District looking east from proposed right-of-way.
10 feet from construction. Weedy and open areas continue further west behind the District

Photo Views of Lagomarsino District

FIGURE

6-1

C. Application of the Criteria of Effect

Because the completed project would be located below the surface in this area, the undertaking would not result in any permanent effects or changes to the setting of the district. Construction activity would be temporary, and as the area behind the district is industrial in nature, the addition of construction activity would not be considered an effect to the setting in any case. Therefore, the project is considered to have no effect on this district.

VII. CUT STONE BRIDGE

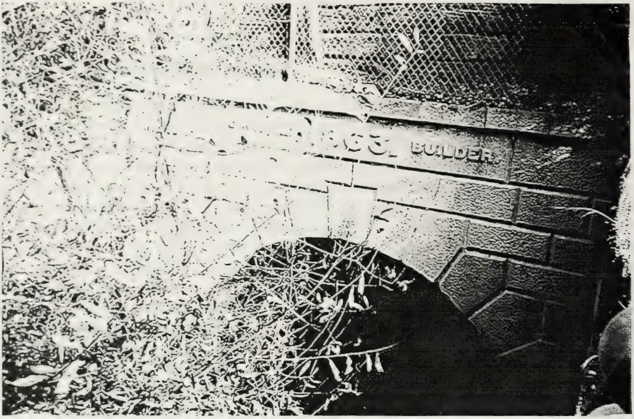
A. Description of Eligible Property

The cut stone bridge or culvert constructed in 1863 to channel winter runoff under the old San Francisco-San Jose Railroad is a structure significant in the theme of engineering history. Due to its age, associations, distinctiveness and rarity, it qualifies for the National Register of Historic Places under Criteria A and C. It is associated with a key event (Criterion A) in the history of this section of California, the construction and operation of the San Francisco-San Jose Railroad. The method of construction, the materials used, and the plan, style, proportion, and form of the structure are all distinctive. It is a structure eligible for the National Register as an important example of California building practices during the 1860s. It illustrates well the pattern of features common to this class of resources. Its significance is local and its period of significance is the 1860s, when the San Francisco-San Jose Railroad was built and first operated. It has excellent integrity of location, design, materials, workmanship, and association. However, the integrity of the bridge's setting has been somewhat compromised by the nearby development of South Spruce Avenue and local infrastructure. Only the south side of the bridge is visible.

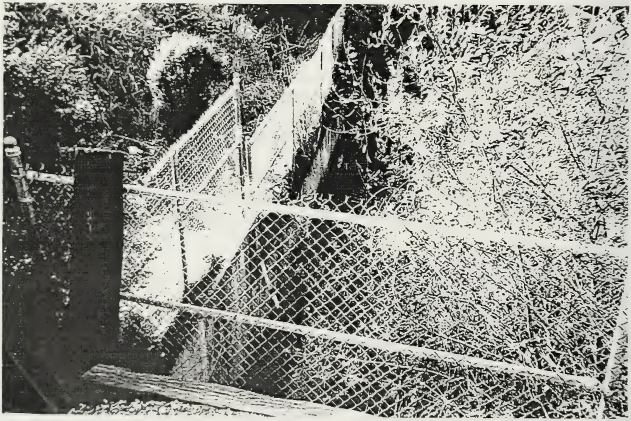
The bridge runs east-west and is perpendicular to South Spruce Avenue, which is designated an arterial street. Water flows under the bridge in a culvert that runs north-south and parallel to South Spruce Avenue. One wing wall on the south side, that is visible from South Spruce, has been covered or removed by street construction. Also, a cement culvert leading into an underground drainage system has been constructed against the north side of the bridge and vegetation has grown over it. Therefore, the northern side of the bridge is not visible and it is currently impossible to determine what that facade of the bridge looks like, or of its existence. Figure 7-1 provides a photograph facing north and looking at the visible south headwall, which is the only angle from which the bridge can be seen. The second photograph is the view looking south from the bridge; this is the view that would be seen from a proposed bike path which may traverse over the bridge.

B. Description of Effect of Undertaking on Eligible Property

BART construction in the Spruce Avenue area calls for removal of the bridge. The San Mateo County Transit District (SamTrans), in conjunction with the Peninsula Corridor Joint Powers Board, would purchase the San Bruno Branch Line of the Southern Pacific Transportation Company property --including the bridge -- as part of the undertaking. Construction of the BART alignment would be in cut and cover construction at a level below the existing bridge, approximately 10-15 feet below the structure. Construction at this subsurface level allows for coordination of BART construction with future improvements at Spruce Avenue and Colma Creek further north. In order to construct at this depth, the bridge must be removed. Upon completion of subsurface BART



Visible headwall of cut stone



View from bridge looking west and down into culvert; view is also from potential bike path (headwall cannot be seen from this direction)

Photo Views of Cut Stone Bridge

FIGURE

7-1

construction, a new concrete culvert meeting seismic and other applicable codes would be built and the functional use of the culvert would remain.

C. Application of the Criteria of Effect

This undertaking would result in an adverse effect to the cut stone bridge, as it would result in the physical removal of the structure. Mitigation proposed below would include replacement of the south headwall onto a new bridge structures. This mitigation would restore the look of the bridge and preserve the stone masonry of the visible headwall. But because the bridge itself would be removed for the project, the effect remains adverse.

D. Alternatives Considered

As the project purpose is to connect the existing BART Colma Station with the San Francisco Airport and the City of Millbrae, the number of alternatives for alignments are limited. The options are further restricted by availability of linear right-of-way. The DEIR/SDEIS identified 7 build alternatives - all of which contained the same impacts to the cut stone bridge. The following alternatives to removal and reconstruction of the cut stone bridge were examined:

- Relocation of the project alignment far enough to the east or west to avoid the bridge: This alternative would require removing the BART track from the existing railroad alignment and would result in costly right-of-way acquisition and possible alternative displacement; greater disturbance to the seasonal wetland west of South Spruce Avenue and south of the SPT Co. tracks; and possibly greater groundborne noise and vibration effects to adjacent land uses on either side of the alignment.

- Suspension of the bridge while performing construction underneath: This alternative was concluded to be a safety hazard and would not be an acceptable construction practice. Moreover, the integrity of the bridge would not be anticipated to withstand vibration or other subsurface activity while in suspension.

- Replacement of the entire bridge structure: This alternative was considered, but was rejected because the amount of reinforcement necessary to bring it up to code would not allow for reconstruction without significant alteration. Also, as the bridge is now connected to and hidden by existing infrastructure for Spruce Avenue and the existing culvert system, this type of replacement would not be practical and would not likely expose any additional views of the bridge.

- Implementation of No-Build and non-BART alternatives: Given the significance of the proposed project in the context of reducing traffic, improving air quality and improving regional transportation, No-Build and non-BART alternatives are not considered viable alternatives.

E. Mitigation Measures Proposed

The proposed mitigation for the adverse effect of this undertaking on the cut stone bridge includes dismantling the bridge and reconstructing the visible headwall on the south side in approximately the same location. The new bridge may be somewhat wider but reconstruction would allow for the headwall currently visible to remain visible. The appearance of the cut stone bridge as it is seen looking north from South Spruce Avenue would be restored and the existing visual aspects of the structure would be preserved. Specific mitigations included in the draft MOA are:

- First, prior to the removal of this bridge, it would be recorded as part of the National Park Service's Historic American Engineering Record.

- Second, the visible headwall of the bridge would be dismantled under the supervision of an expert professional stonemason. The stones on the visible headwall would be numbered so that the stones can be reassembled in their original order during construction of a new bridge.

- Third, a new bridge, up to code and current engineering standards would be constructed of concrete. This bridge, as with the existing one, would not be visible to passers-by. The west original headwall would be returned to its original position. The resulting new bridge would look virtually the same as the original.

- Fourth, BART, would provide a marker or display identifying the bridge location and its historical significance. BART, SamTrans, and other members of a bike path planning committee, if established, would work together to ensure that the bridge is integrated into any proposed bike paths near the bridge. This effort would include incorporating this marker display as part of the bike path.

VIII. RESIDENCE AT 540 SAN ANTONIO BOULEVARD

A. Description of Eligible Property

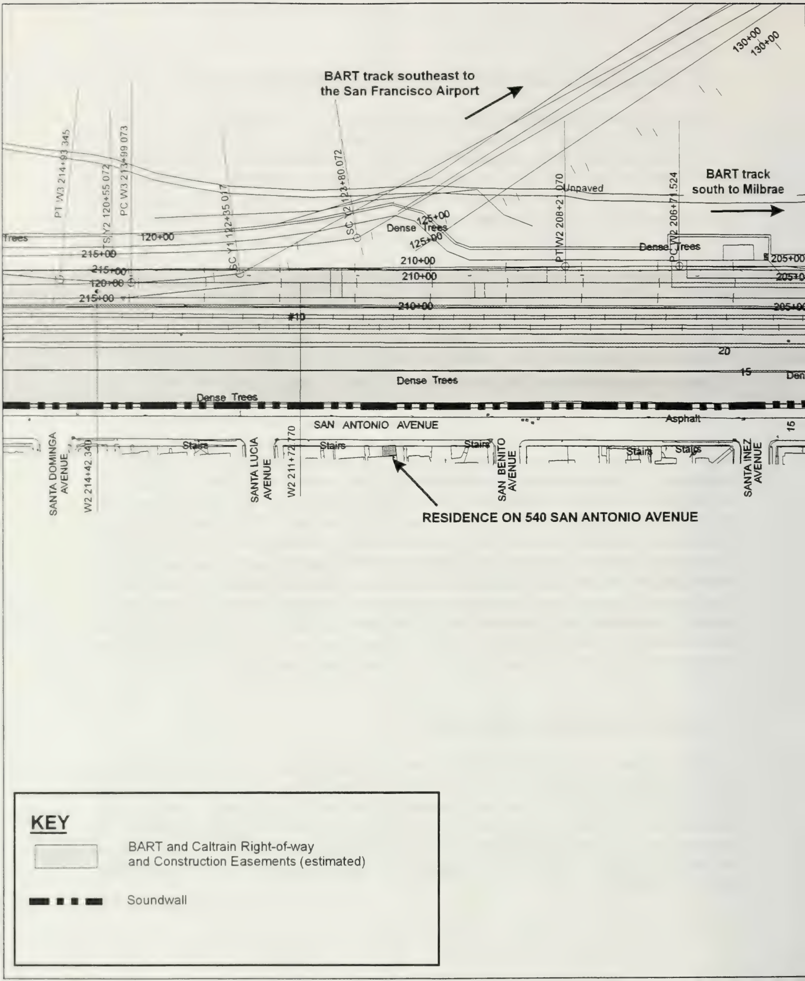
This large Craftsman bungalow (ca 1910-1915) is an exceptional example of domestic style in the San Bruno area. It has especially fine ashlar stonework on the large, front entrance porch. In addition to the porch design, the house has especially fine architectural detailing, such as its carved cornice brackets and overscaled, asymmetrical front dormer. These features are characteristic of the period when the house was constructed, making this building an outstanding example of its era and style. It has a high level of integrity, showing little or no alteration from the original. Because of the fine architectural detailing, this residence is much more distinguished than other examples of this fairly common domestic style of bungalow. It therefore meets National Register Criterion C.

B. Description of Effect of Undertaking on Eligible Property

The proposed BART right-of-way would be located across the street from this building on the east side of San Antonio Boulevard; the property is located on the west side (See Figure 8-1). Currently this structure has views to the east of eucalyptus trees and other vegetation on otherwise vacant property owned by the San Francisco Water District. A sound wall would be built as part of the BART project along San Antonio to shield residences from potential noise generated from BART at-grade. Preliminary engineering indicates that this sound wall would be placed at the edge of the vacant property and views of trees and some open space would be removed. Final design would determine the exact location of this soundwall; the possibility exists that the sound wall could be moved further east, thus maintaining some of the vegetation currently visible. No direct effects to the bungalow are anticipated, as construction activities for BART would be across San Antonio Boulevard and over 30 feet away. Some noise and dust would occur during construction; groundborne vibration at a perceptible level is not anticipated.

C. Application of the Criteria of Effect

Since a sound wall is planned between the tracks and the street, and a BART facility is planned across the street from this eligible structure the setting, the integrity of the setting for this structure would be somewhat diminished. Importantly, however, the project would have no effect on the architectural qualities which appear to qualify this structure for the National Register. Since the building's eligibility is based on its architectural merit, a minor loss of integrity of setting would not affect its National Register Eligibility.



BART
Schematic of 540 Antonio Blvd.
In Project Context

FIGURE

8-1

IX. MILLBRAE TRAIN STATION

A. Description of Listed Property

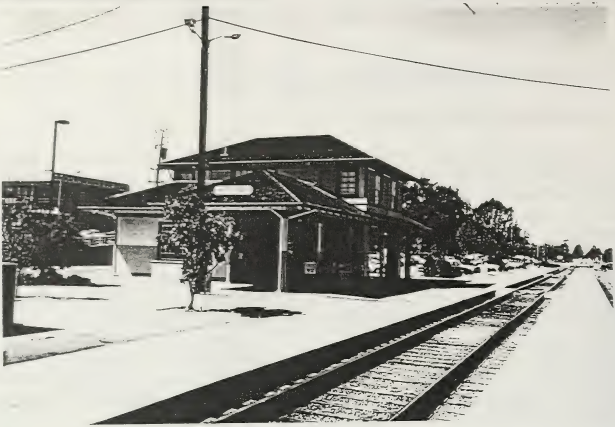
The Millbrae Train Station -- also referred to as the Millbrae Southern Pacific Depot and the Millbrae CalTrain Station -- is the one property in the APE which is already on the National Register. It consists of a two-story, wood-frame structure with a hipped roof of wood shingle materials. The building was constructed as a depot in 1907 by the Southern Pacific Railroad Company, with the lower floor containing features such as a baggage room, waiting area and ticket window. It is typical of those built in the early 1900's with the Colonial Revival look. The importance of a railroad stop in Millbrae was highly significant to the growth and prosperity of the community; the small population of this area, originally a rancho, expanded greatly with introduction of the rail line.

The building was nominated for the National Register of Historic Places in 1977 and was placed on the Register thereafter as the "Southern Pacific Depot". The building was placed on the NRHP because as it is associated with railroad events that have made a significant contribution to the area (Criterion A). It also meets Criterion C as it embodies the distinctive architectural characteristics from the early 1900's. Records for the structure indicate that the NRHP nomination was based on the structure and not the setting, as measurements of the roof line were used to define the property in the NRHP Inventory-Nomination Form. See Figure 9-1 for photographs of the station.

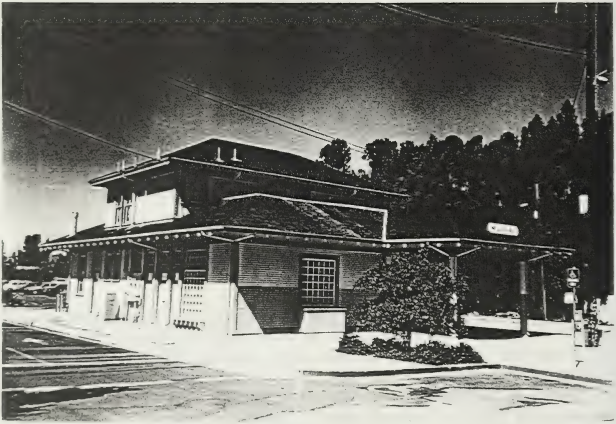
The Millbrae Train Station is located at Millbrae Avenue and California Drive in Millbrae. Its original location was 200 feet north along Millbrae Avenue and was moved in 1970 to accommodate widening of the avenue. The depot is still in use as a train stop and tickets for the Caltrain commuter system are sold from the ticket office until 1:00 PM on weekdays. A small coffee shop is located in the old baggage room and offices are on the second floor. The structure is owned by the California Department of Transportation (Caltrain), which is currently negotiating title transfer to the Peninsula Corridor Joint Powers Board, the operator of the Caltrain system.

B. Description of Effect of Undertaking on Listed Property

The proposed BART project would include a new "intermodal" station combining a BART and Caltrain passenger station at the terminus station on the project route. This new station would be built in Millbrae at El Camino Real and Millbrae Ave and would accommodate cross platform transfers from BART to the existing northbound Caltrain track. With development of the new station, the platform center for both BART and Caltrain passenger loading would be located approximately 650 feet north of the existing Millbrae Train Station, on the north side of Millbrae Ave. The Caltrain platform would thus be shifted north to be integral with the new BART station, so that the southern most edge of the platform would be approximately 200 feet north of the historic station instead of directly in front of it. (See Figure 9-2 for a sketch of the structure in the project



View of station looking north

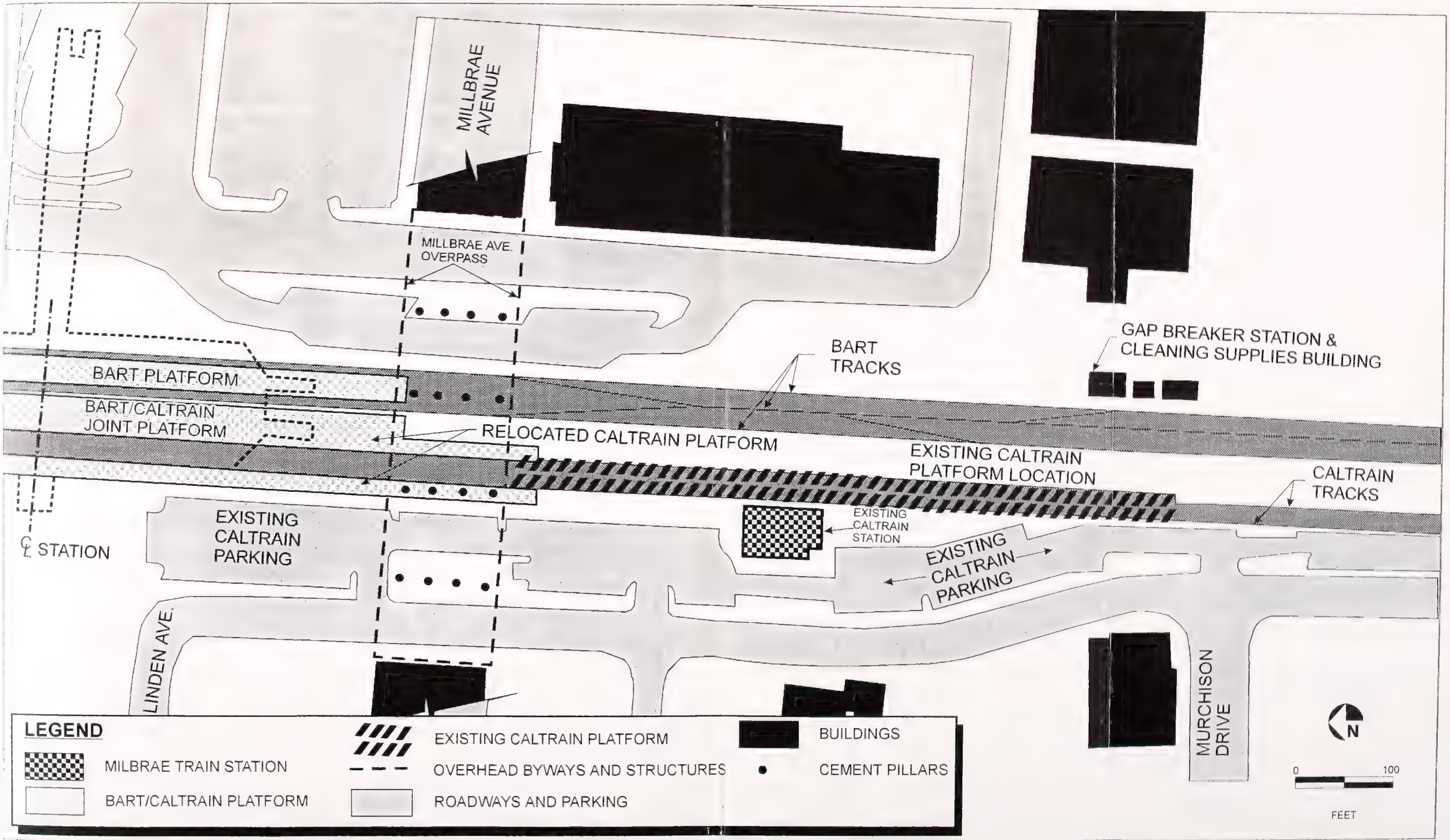


View of Station looking south

Photo Views of the Milbrae Train Station

FIGURE

9-1


MILLBRAE AVENUE
MILLBRAE AVE. OVERPASS
BART TRACKS
GAP BREAKER STATION & CLEANING SUPPLIES BUILDING
BART PLATFORM
BART/CALTRAIN JOINT PLATFORM
RELOCATED CALTRAIN PLATFORM
EXISTING CALTRAIN PLATFORM LOCATION
CALTRAIN TRACKS
EXISTING CALTRAIN PARKING
EXISTING CALTRAIN STATION
EXISTING CALTRAIN PARKING
℄ STATION
LINDEN AVE.
MURCHISON DRIVE
N
0
100
FEET
LEGEND
MILBRAE TRAIN STATION
BART/CALTRAIN PLATFORM
EXISTING CALTRAIN PLATFORM
OVERHEAD BYWAYS AND STRUCTURES
ROADWAYS AND PARKING
BUILDINGS
CEMENT PILLARS

Schematic
Millbrae Train Station
BART Development

FIGURE

9-2

context). Because the parking area for Caltrain patrons (which extends several hundred feet south of the Millbrae Train Station) would remain, many of the passengers parking south of the historic station would continue to use the station to access the train platform.

The station would remain in active use after the new BART station is constructed. Caltrain ticket sales are anticipated to remain at the existing Millbrae Train Station. The existing waiting area inside the station would also remain for Caltrain patrons. Continued use of lessee activities, including offices on the second floor, are also anticipated. In sum, as the station will continue to be located in a populated and active area, the station would be capable of maintaining viable existing uses despite the addition of another northerly patron access point.

C. Application of the Criteria of Effect

The undertaking would not have an effect on the Millbrae Train Station, as the station will remain in its existing location. The creation of an intermodal station for Caltrain and BART would not alter the use of the property and would not affect the attributes that qualify it for the National Register. The project will have no direct or permanent effect on the structure itself; only the structure was proposed for nomination on the NRHP. Although the setting of the structure would be slightly altered as the existing adjacent platform shifts north, surrounding activities that characterize active use of the station (such as waiting area, adjacent track, parking, commercial uses, ticket sales), would not be altered.

Some temporary impacts from construction would occur but would not affect the properties status on the NRHP. As the BART track would be developed at-grade and east of the existing Caltrain track, the temporary construction impacts to the station would include noise and dust. Construction could be less than 20 feet away from the station but it is not anticipated that construction would affect the structure or impede use of it. Vibration impacts to the structure during operations are not anticipated because the trains will be moving at a slow speed as the enter and exit the proposed BART Millbrae station.

X. SUMMARIES AND VIEWS OF SHPO AND INTERESTED PERSONS

Other than the Millbrae Train Station (which is already listed on the NRHP) and the Colma Railroad Station (which has already been determined eligible), the SHPO concurred in the eligibility of the properties discussed in this Finding of Effect (See Appendix C for Correspondence). BART staff conferred with SHPO regarding the possible project effects on these properties in preparation of this document during a meeting on November 19, 1995 as well as through several telephone conversations. In these discussions, it was concluded after the initial evaluation that, after relocation of the Colma Train Station from the APE, the undertaking would create adverse effects only to the cut stone bridge and the Millbrae Train Station. During the development of this Finding of Effect, BART consulted with the responsible and interested parties for the Millbrae Train Station and the cut stone bridge, in particular, and for other properties for which BART identified any perceived or potential effects.

For the Millbrae Train Station, the parties that were consulted in conjunction with development of potential mitigation measures included staff from: the City of Millbrae (representing the Millbrae Redevelopment Dept., Millbrae Planning Dept. and the Millbrae Historic Commission); CalTrans, the current owner of the station; the Peninsula Corridor Joint Powers Board, future owners of the station; SamTrans; and the South Bay Historical Railroad Society. After these consultations, and further engineering and design work performed after selection of the LPA in November 1995, it was determined that the project could be built without any effect to the station. Previous determination that the station would need to be moved was deemed no longer necessary due to advances in project engineering.

For the cut stone bridge, the parties that were consulted included staff from the South San Francisco Historical Society and the City of South San Francisco. Through consultations, these parties have concurred that the Finding of Adverse Effect is appropriate, and have contributed to the mitigations reflected in the draft MOA.

In addition to these specific consultations regarding the cut stone bridge and the Millbrae Train Station, discussions about the historic character of the resources and potential effects have been conducted with several entities, as listed in Section II. In this regard, BART and SamTrans have consulted with, and would continue to consult with, the staff from each of the cemeteries and the Colma Cemetery Coalition even though the undertaking would not have an adverse effect on properties in the cemeteries. This consultation will cover, among other subjects, precautionary and special construction measures, required to ensure that construction takes place with minimal impacts to sensitive areas.

APPENDIX A

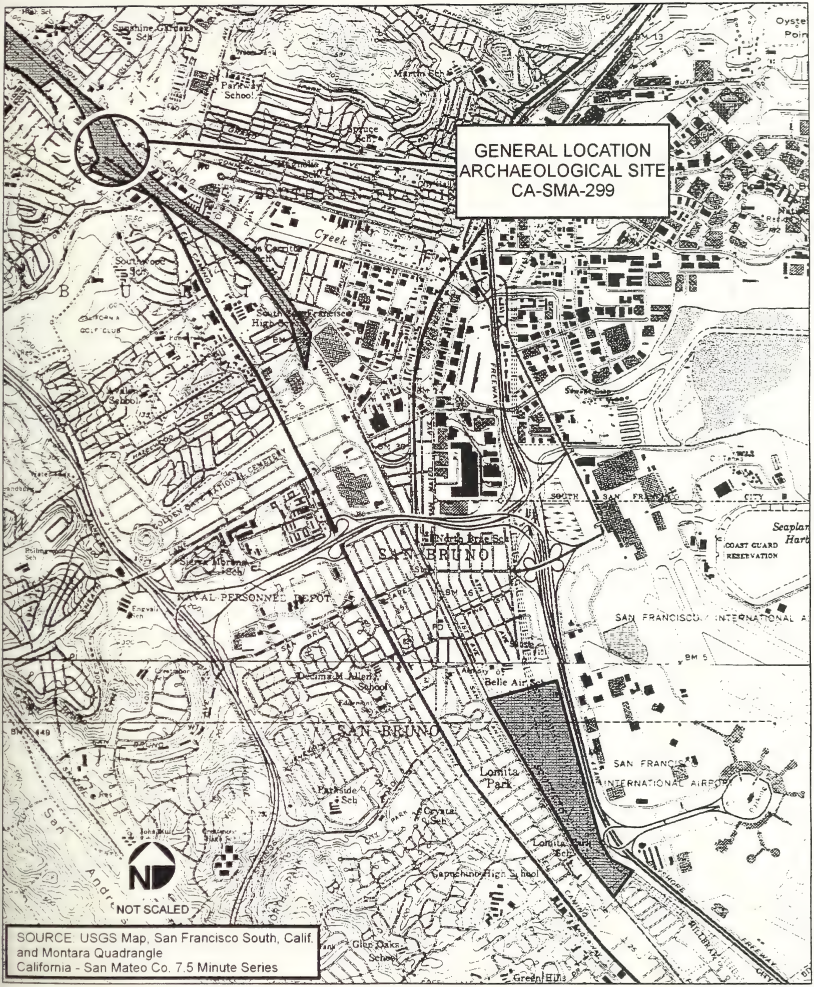
ARCHEOLOGICAL SITE CA-SMA-299

One previously recorded prehistoric archaeological site, San Mateo site 299 (CA-SMA-299) is located in South San Francisco within the project APE. The site is located within the Archeological Survey Area identified in Figure A-1. It was recorded in 1989 as "... a large shell midden with shell in patches of varying density on the north and south banks of the creek".

The site record, completed in 1989, states that the site has been "completely destroyed", not only by creek channelization, railroad tracks and other construction, but by systematic mining of the midden itself as 'Colma Loam,' sold as gardening soil in the 1930's to 1950's". During the field survey, for the proposed extension, it appeared that large equipment was used recently to scrape and pile surface dirt and fill. In addition, construction of the large parking garage for Kaiser Hospital, located directly west of the former site, and landscaping appear to have contributed to completely erasing all traces of the site. The presence of utility lines below the surface provide further indication that the site is highly disturbed at deeper levels as well as at the surface.

The site was examined by Consulting Archaeologist Carolyn Rice as part of this project. The testing phase for this site was limited to shovel test pits and auger holes to determine the presence or absence of cultural material. A total of 20 auger holes were bored, but no cultural material was found. Shovel tests also yielded no cultural material. Full detail of this testing was included in the Archaeological Resources Technical Report (December 1994). The proposed area does not include any known structures or sites significant to ethnic or religious values.

As no remains have been found on this site and as it is likely to have further subsurface disturbance due to existing utility lines, it has been determined that the site is destroyed and not eligible for the National Register of Historic Places (See Appendix C for correspondence from the SHPO on this subject).



SOURCE: USGS Map, San Francisco South, Calif.
and Montara Quadrangle
California - San Mateo Co. 7.5 Minute Series

FIGURE

A-1

BART
ARCHAEOLOGICAL SURVEY AREA

APPENDIX B

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APPENDIX C

CORRESPONDENCE

From	To	Date
Ogden (Carolyn Rice) Cultural Resources Specialist	13 Native American Representatives (Sample Letter)	August 16, 1993
Office of Historic Preservation (Cherilyn Widell, State Historic Preservation Officer)	Stewart F. Taylor Regional Administrator Federal Transit Administration	July 14, 1994
Office of Historic Preservation (Cherilyn Widell, State Historic Preservation Officer)	Stewart F. Taylor Regional Administrator Federal Transit Administration	September 22, 1994
Office of Historic Preservation (Cherilyn Widell, State Historic Preservation Officer)	Stewart F. Taylor Regional Administrator Federal Transit Administration	December 26, 1995
Office of Historic Preservation (Cherilyn Widell, State Historic Preservation Officer)	Stewart F. Taylor Regional Administrator Federal Transit Administration	December 27, 1995
Office of Historic Preservation (Cherilyn Widell, State Historic Preservation Officer)	Stewart F. Taylor Regional Administrator Federal Transit Administration	April 18, 1996
Office of Historic Preservation (Cherilyn Widell, State Historic Preservation Officer)	Stewart F. Taylor Regional Administrator Federal Transit Administration	April 18, 1996

OGDEN *ENVIRONMENTAL AND ENERGY SERVICES*

221 Main Street, Suite 1400
San Francisco, CA 94105
415 227 4370
Fax 415 227 4376

SAMPLE OF LETTER SENT TO NATIVE AMERICAN REPRESENTATIVES

August 16, 1993

Andrew Galvan
P.O. Box 3152
Mission San Jose, CA 94539

Re: BART San Francisco International Airport Extension Project

Dear Mr. Galvan:

Ogden Environmental and Energy Company, Inc., is currently preparing a recirculated Environmental Impact Report for the referenced project in both San Francisco and San Mateo counties. The project includes a corridor that is under potential impact from the proposed train route extension to San Francisco International Airport. The area under study is depicted on the enclosed map.

We respectfully request any information and input that you may have regarding both Native American and historic concerns, either directly or indirectly associated with this project area. We would also be interested in knowing whether or not there are individuals in the area who should be contacted prior to the continuation of this project. If you have information, concerns or other input, please submit them in writing, so that they may be incorporated in the final report.

We appreciate your assistance in this matter. If you have any questions or require any further information regarding this project, please contact me at the address listed above.

Sincerely,

Carolyn Rice

Carolyn Rice
Cultural Resources Specialist

CR/rc

Enclosure

Name address telephone	Tribal affiliation
Amah Tribal Band Chairperson: Irene Zwierlein 789 Canada Road Woodside, CA 94062 (415) 851-7747	Ohlone
Esselen Nation Chairperson: Loretta Escobar-Wyer P.O. Box 464 Palo Alto, CA 94302 (408) 924-1572 Office (415) 390-9919	Ohlone/Esselen
Andrew Galvan P.O. Box 3152 Mission San Jose, CA 94539 (510) 656-0777 (510) 656-2364 Message	Ohlone
Frances Garcia 425 Queen Street, #33 King City, CA 93930-3719 (408) 385-5591	Ohlone/Salinan
Indian Canyon Mutsun Band of Costanoan People Chairperson: Ann Marie Sayers P.O. Box 28 Hollister, CA 95024-0028 (408) 637-4238	Ohlone
Jakki Kehl 1675 North Corral Hollow Rd. Tracy, CA 95376 (209) 832-7403	Ohlone
Kenneth Marquis 4659 Bolero Drive San Jose, CA 95111 (408) 226-3357	Ohlone

NATIVE AMERICAN REPRESENTATIVES CONTACTED BY LETTER
(SEE SAMPLE LETTER TO ANDREW GALVIN PRECEDING THIS LIST)

Name address telephone	Tribal affiliation
Jenny Mousseaux (Mcleod) P.O. Box 610546 San Jose, CA 95161 (408) 249-6049	Salinan/Chumash/Ohlone
Muwekma Indian Tribe Chairperson: Rosemary Cambra 1845 The Alameda San Jose, CA 95126 (408) 293-9956	Ohlone
Patrick Orozco 110 Dick Phelps Road Watsonville, CA 95076 (408) 728-8471	Ohlone
Alex Ramirez 4910 Alum Rock Ave San Jose, CA 95127 (408) 923-0204	Ohlone
Ella Mae Rodriquez 1188 Phoenix Ave, House B Seaside, CA 93955 (408) 394-8176	Ohlone
Linda Yamane 1385 Harding Street Seaside, CA 93955 (408) 394-5915	Ohlone

NATIVE AMERICAN REPRESENTATIVES CONTACTED BY LETTER
(SEE SAMPLE LETTER TO ANDREW GALVIN PRECEDING THIS LIST)

STATE OF CALIFORNIA — THE RESOURCES AGENCY PETE WILSON, Governor

OFFICE OF HISTORIC PRESERVATION

DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO 94296-0001
(916) 653-6624
FAX: (916) 653-9824

July 14, 1994

REPLY TO: UMTA900828A

Stewart F. Taylor, Regional Administrator
U.S. Department of Transportation, Region IX
Federal Transit Administration
211 Main Street, Room 1160
SAN FRANCISCO CA 94105

Project: BART - San Francisco Airport Extension

Dear Ms. Kugler:

The Office of Historic Preservation (OHP) has received the document titled, "A Historic Resources Evaluation Report of Seven Colma Cemeteries, Colma California". My staff has reviewed and provides the following comments on the documentation you submitted in support of the cited project.

Your report appears to have followed the recent guidance provided by the National Park Service on the eligibility of cemeteries (National Register Bulletin 41). However, the photocopies of photographs included in the historic property forms are not sufficiently clear to allow me to concur in your determinations. Please forward original photographs so I can continue my review of the documentation.

Your consideration of historic properties in the project planning process is appreciated. If you have any questions regarding our review of this undertaking, please call Gary Reinoehl of our staff at (916) 653-5099.

Sincerely,

Cherilyn Widell
State Historic Preservation Officer

cc: Joan A. Kugler, AICP, Planning Manager, BART District

STATE OF CALIFORNIA — THE RESOURCES AGENCY
PETE WILSON, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO 94296-0001
(916) 653-6624
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September 22, 1994

REPLY TO: UMTA900828A

Stewart F. Taylor, Regional Administrator
U.S. Department of Transportation, Region IX
Federal Transit Administration
211 Main Street, Room 1160
SAN FRANCISCO CA 94105

Project: BART - San Francisco Airport Extension

Dear Mr. Taylor:

Bay Area Rapid Transit has forwarded on your behalf the following documents, "Archaeological Resources Technical Report" and "Archaeological Survey Report". In addition, original photographs illustrating the details of the historic resources evaluation have been provided in order to facilitate the review of the seven cemeteries. My staff has reviewed and provides the following comments on the documentation you submitted in support of the cited project.

The archeological report indicates that one site was previously recorded within the Area of Potential Effect (APE) of the undertaking. No other archeological properties were identified during the inventory. Surface remains of CA-SMa-299 could not be identified. An augering program was initiated, but no subsurface remains were identified. The contractor then recommends backhoe testing be undertaken prior to the commencement of the project to ensure identification and evaluation of this site.

The recommendations in the report suggest the identification effort is not adequate. The list of auger holes and the accompanying USGS map with the auger holes marked on it gives little indication of the distance between the auger holes or a justification for the locations chosen. The descriptions of the locations of the auger holes is lacking in many cases. The map lacks sufficient detail. It would be much better if one or two maps were prepared that delineate the limits of the recorded site and the auger holes placed within and in the vicinity of the recorded site. A second map could be prepared delineating, in greater detail, the auger hole locations south of the recorded site.

I would like to have copies of the documentation of your efforts under 36 CFR 800.4(a)(1)(iii) to seek information and comments from Indian tribes.

You have considered the eligibility of seven cemeteries within the Area of Potential Effect (APE) for the undertaking. You have determined that five cemeteries make up four cemetery districts. These are the (1) Italian Cemetery, (2) the Home of Peace and the Hills of Eternity Memorial Park, (3) The Cypress Lawn Memorial Cemetery, and (4) the Holy Cross Cemetery. The statement of significance on which the determination is based is on pages twenty eight through thirty of *"A Historic Resources Evaluation Report of Seven Colma Cemeteries, Colma, California"*.

In your background you have provided a context that documents that history of the removal of the cemeteries from San Francisco and the development of the cemeteries in Colma. You state that this was a significant event in San Francisco's history and that it was a rare event in modern United States history. You have also stated that state and legal laws were the basis for a long legal and political battle over the fate of the cemeteries in San Francisco. However, this context statement is not used in the significance of the cemeteries and the determination of eligibility under criterion A.

You have determined that the Italian Cemetery is eligible as a district for the National Register of Historic Places (NRHP) under criterion C. I concur with your determination that the Italian Cemetery is eligible for the NRHP under criterion C. It appears this cemetery could also be eligible under criterion A. Was this still the only Italian Cemetery in the United States when it was established?

You have determined the Home of Peace Cemetery and the Hills of Eternity Memorial Park are eligible for the NRHP as a district under criteria B and C. I concur with your determination that the Home of Peace Cemetery and the Hills of Eternity Memorial Park are eligible for the NRHP as a district under criteria B and C. Please consider eligibility of this property under criterion A for the previously mentioned significance and because the Home of Peace is the largest and oldest Jewish Cemetery in the west.

You have determined the Cypress Lawn Memorial Park is eligible for the NRHP as a district under criteria B and C. I concur with your determination that the Cypress Lawn Memorial Park is eligible for the NRHP as a district under criteria B and C. Could this cemetery be considered under criterion A because it was the first non-religious cemetery at Colma or because of its association with the removal of cemeteries from San Francisco?

You have determined the Holy Cross Cemetery is eligible for the NRHP as a district under criteria B and C. I concur with your determination that the Holy Cross Cemetery is eligible for the

NRHP as a district under criteria B and C. Could this cemetery be considered under criterion A because because of its association with the removal of cemeteries from San Francisco?

You consider the eligibility of the Eternal Home Cemetery and the Salem Memorial Park, stating they do not appear to qualify for the NRHP. However, it is not clear whether you considered the eligibility of these properties under criterion A for the association with the removal of cemeteries from San Francisco. Please provide an assessment of all of the cemeteries as it relates to this context. Is it possible there could be a larger district of cemeteries related to this event?

Your reports indicate that the BART alignment will parallel the Southern Pacific railroad tracks. Are the Southern Pacific railroad tracks a historic property?

Your consideration of historic properties in the project planning process is appreciated. If you have any questions regarding our review of this undertaking, please call Gary Reinoehl of our staff at (916) 653-5099.

Sincerely,

Cherilyn Widell
State Historic Preservation Officer

cc: Joan A. Kugler, AICP, Planning Manager, BART District

STATE OF CALIFORNIA — THE RESOURCES AGENCY
PETE WILSON, Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO 94296-0001
(916) 653-6624
FAX: (916) 653-9824

JAN [illegible]

December 26, 1995

REPLY TO: UMTA900828A

Stewart F. Taylor, Regional Administrator
U.S. Department of Transportation, Region IX
Federal Transit Administration
211 Main Street, Room 1160
SAN FRANCISCO CA 94105

Project: BART - San Francisco Airport Extension

Dear Mr. Taylor:

Bay Area Rapid Transit has forwarded on your behalf the following document, "Historic Architectural Survey Technical Report, Volume II: Alternative VI, Highway 380 to Trousdale Drive in Burlingame". My staff has reviewed and provides the following comments on the documentation you submitted in support of the cited project.

The report documents seventy nine buildings or building complexes within the Area of Potential Effect (APE) of the undertaking. Forty five of the properties were constructed after 1946 and were not of exceptional significance. Thirty three properties were built before 1946 and were found to not meet the requirements for eligibility for the National Register of Historic Places (NRHP). The remaining building, the Millbrae Southern Pacific Railroad Depot (MSPRD), is listed on the NRHP.

I have reviewed your documentation, and concur with your finding that the properties listed in Table 2 of your report are not eligible for the NRHP (attached). The listing of the MSPRD is consistent with my records.

Your consideration of historic properties in the project planning process is appreciated. If you have any questions regarding our review of this undertaking, please call Gary Reinoehl of our staff at (916) 653-5099.

Sincerely,

Cherilyn Widell
State Historic Preservation Officer

cc: Karita Zimmerman, Planner, BART

Table 2:
PRE-1946 BUILDINGS

Address	Type	Date	NR Status
1. 967 Montgomery Street	house	1925	ineligible
2. 957 Montgomery Street	"	1915	"
3. 949 Montgomery Street	"	1946	"
4. 133 Walnut Street	"	1939	"
5. 101 San Bruno Avenue East	commercial	1942	"
6. 973 Huntington Street	apartment	1914	"
7. 933 Huntington Street	house	1925	"
8. 122 Euclid Street	"	1941	"
9. 111 Euclid Street	"	1943	"
10. 891 Huntington Street	retail/apt.	1929	"
11. 883 Huntington Street	house	1940	"
12. 875 Huntington Street	"	1922	"
13. 843-847 Huntington Street	apartment	1924	"
14. 831-835 Huntington Street	duplex	1930	"
15. 827 Huntington Street	house	1919	"
16. 823 Huntington Street	"	1919	"
17. 819 Huntington Street	"	1927	"
18. 100 San Bruno Avenue	commercial	1941	"
19. 759 San Mateo Avenue	meeting hall	1934	"
20. 733-737 San Mateo Avenue	commercial	1907	"
21. 711-715 San Mateo Avenue	"	1929	"
22. 659 Huntington Street	"	1910	"
23. 605-611 Huntington Street	houses	1942	"
24. 537 Huntington Street	house	1925	"
25. 105-119 Sylvan Street	duplex	1940	"
26. 493 Huntington Street	house	1925	"
27. 421-485 Huntington Street	houses	1940-1943	"
28. 102 Florida Street	house	1926	"
29. 104 Florida Street	"	1926	"
30. 105 Florida Street	"	1926	"
31. 381 Huntington Street	"	1940	"
32. 365 Huntington Street	"	1927	"
33. Bayside Manor	houses	1944	"
34. Millbrae Train Station	train station	1907	listed

STATE OF CALIFORNIA — THE RESOURCES AGENCY **PETE WILSON, *Governor***

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
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[illegible]
JAN 0 4 1996
SYSTEM SAFETY DEPT

December 27, 1995

REPLY TO: UMTA900828A

Stewart F. Taylor, Regional Administrator
U.S. Department of Transportation, Region IX
Federal Transit Administration
211 Main Street, Room 1160
SAN FRANCISCO CA 94105

Project: BART Extension from Colma to San Francisco International Airport

Dear Mr. Taylor:

Bay Area Rapid Transit has forwarded on your behalf the following document, "Archaeological Resources Technical Report, June 1994". My staff has reviewed and provides the following comments on the documentation you submitted in support of the cited project.

You have provided more detailed information in the current report concerning CA-SMa-299, including your efforts to seek information from Native American representatives. Numerous underground utilities exist in the recorded location of the site. The augering program appears to adequate to demonstrate that the site has been destroyed. You have determined that CA-SMa-299 is not eligible for the National Register of Historic Places (NRHP). I concur with your determination that CA-SMa-299 is not eligible for the NRHP.

Your consideration of historic properties in the project planning process is appreciated. If you have any questions regarding our review of this undertaking, please call Gary Reinoehl of our staff at (916) 653-5099.

Sincerely,

Cherilyn Widell
State Historic Preservation Officer

cc: Karita Zimmerman, Planner, BART

STATE OF CALIFORNIA — THE RESOURCES AGENCY PETE WILSON, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO 94296-0001
(916) 653-6624
FAX: (916) 653-9824

April 18, 1996

REPLY TO: UMTA900828A

Stewart F. Taylor, Regional Administrator
U.S. Department of Transportation, Region IX
Federal Transit Administration
211 Main Street, Room 1160
SAN FRANCISCO CA 94105

Project: BART - San Francisco Airport Extension

Dear Mr. Taylor:

The State Historic Preservation Officer (SHPO) has reviewed and provides the following comments on the documentation you submitted in support of the cited project.

Your Historical Architectural Survey Technical Report, Volume III, indicates that forty four pre-1946 resources were evaluated. Your determination of eligibility for the National Register of Historic Places (NRHP) is provided in pages 29 and 30 of the report. I concur with your determinations listed on those pages (residence at 540 San Antonio Avenue is eligible for the NRHP under criterion C, all other resources are not eligible for the NRHP).

You also noted that I had not commented on your determinations for the Salem Memorial Office Building, the Lagomarcino Farm District, and the Cut Stone Bridge. I will provide the following comments:

- * You have indicated the Salem Memorial Office Building is eligible for the NRHP under criterion A and C. You indicate it is eligible under criterion A because of its association with the continued development of the cemetery industry in Colma in the 1930s. You have not provided a context for the development of the cemetery industry in the town of Colma. Consequently, there is no convincing argument for the eligibility of the building under criterion A. You indicate it is eligible under criterion C because it is an excellent example of Art Deco/Moderne style. I concur with your determination that the Salem Memorial Office Building is eligible for the NRHP under criterion C.

- * You have indicated the Lagomarcino Farm District is eligible for the NRHP. Unfortunately, your report did not indicate the criterion for which its eligibility is to be considered. The documentation is not complete and puts limitations on my ability to comment on the eligibility of the property. From the information presented, it appears that the farmstead is no longer associated with farmed acreage. This lack of association questions the issue of sufficient integrity for the property to retain eligibility under criterion A. The property could not be considered eligible under criterion B unless additional information is provided to demonstrate the importance of the Lagomarcino family in this area. This may restrict the eligibility to a single structure, their residence. The buildings do not appear to be eligible under criterion C as the sole, best, or good representative examples of Neoclassical design. Until such information is provided, I can not agree with your determination of eligibility.

* You indicate the Cut Stone Bridge is eligible under criteria A and C. The eligibility under criterion A is based on its association with the construction and operation of the San Francisco-San Jose Railroad. The railroad was evaluated and found to lack integrity. I can not agree that this property is eligible as an integral link in the construction on operation of an ineligible property. You have found it eligible under criterion C as an important example of California building practices during the 1860s. The bridge is a rare example of industrial cut stone architecture that retains the essential physical features of this property type. I concur that the cut Stone Bridge is eligible under criterion C as an unusual local example of industrial cut stone architecture.

Your consideration of historic properties in the project planning process is appreciated. If you have any questions regarding our review of this undertaking, please call Gary Reinoehl of our staff at (916) 653-5099.

Sincerely,

Cherilyn Widell
State Historic Preservation Officer

cc: Karita Zimmerman, Planner, BART

STATE OF CALIFORNIA — THE RESOURCES AGENCY PETE WILSON, *Governor*

OFFICE OF HISTORIC PRESERVATION

DEPARTMENT OF PARKS AND RECREATION

P.O. BOX 942896
SACRAMENTO 94296-0001
(916) 653-6624
FAX: (916) 653-9824

April 18, 1996

REPLY TO: UMTA900828A

Stewart F. Taylor, Regional Administrator
U.S. Department of Transportation, Region IX
Federal Transit Administration
211 Main Street, Room 1160
SAN FRANCISCO CA 94105

Project: BART - San Francisco Airport Extension

Dear Mr. Taylor:

The State Historic Preservation Officer (SHPO) has reviewed and provides the following comments on the documentation you submitted in support of the cited project.

Your finding of effect document indicated that your undertaking will result in an Adverse Effect. Your finding of effect states that the Cut Stone Bridge is the only historic property that will be effected by your undertaking. You included a draft Memorandum of Agreement (MOA) that provides the actions you will implement in order to take into account the effects of your undertaking.

Please amend the preamble to the MOA to read as follows:

WHEREAS, the Federal Transit Administration (FTA) has determined that the construction of the proposed extension of Bay Area Rapid Transit District (BART) line to the San Francisco International Airport and Millbrae (BART-SFO Extension), will have an effect on the Cut Stone Bridge, a property eligible for the National Register of Historic Places, and has consulted with the California State Historic Preservation Officer (SHPO) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, the San Mateo County Transit District (SamTrans) and the Peninsula Corridor Joint Powers Board (JPB), as the future owners of the property, and BART have participated in the consultation and have been invited to concur in the Memorandum of Agreement;

NOW, THEREFORE, FTA and the SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

In the last sentence of Stipulation 3, the word "to" seems to be extraneous. Please remove it from the text.

Please insert the following clauses:

> Failure to carry out the terms of this agreement requires that FTA again request the Council's comments in accordance with 36 CRF 800. If FTA cannot carry out the terms of this agreement, it will not take or sanction any action or make any irreversible commitment that would result in adverse effect to the historic property or would foreclose the Council's consideration of modifications or alterations to the undertaking.
>
> If any of the signatories to this agreement believe that the terms of the agreement cannot be met, or that an addendum to the terms of the agreement must be made, that signatory shall immediately notify the other signatories and request consultation to consider an amendment or addendum to this agreement. The process of amending the agreement shall be the same as that exercised in creating the original agreement.
>
> Should the SHPO or Council object within 30 days to any actions proposed pursuant to this Memorandum of Agreement, FTA shall consult with the objecting party to resolve the objection. If FTA determines that the objection cannot be resolved, FTA shall request the further comments of the Council pursuant to 36 CFR 800.6. Any Council comment provided in response to such a request will be taken into account by FTA in accordance with 36CFR 800.6(C)(2), with reference only to the subject of the dispute; FTA's responsibility to carry out all actions under this agreement that are not the subject of the dispute will remain unchanged.

Please revise the signature lines so that the FTA is the first signature and the SHPO the second. The signature line for the ACHP will be below the SHPO with "ACCEPTED:" above the ACHP signature line. It would be best if these three signature lines are on the last page of the MOA. Then a separate page will have the signature lines for the concurring parties. The word "CONCUR:" will only need to be above the first concurring party.

Your consideration of historic properties in the project planning process is appreciated. If you have any questions regarding our review of this undertaking, please call Gary

Reinoehl of our staff at (916) 653-5099.

Sincerely,

Cherilyn Widell
State Historic Preservation Officer

cc: Karita Zimmerman, Planner, BART

APPENDIX D
DRAFT
MEMORANDUM OF AGREEMENT

DRAFT

Memorandum of Agreement
Submitted to the Advisory Council on Historic Preservation
Pursuant to 36 CFR Part 800.6 (a)

WHEREAS, the Federal Transit Administration (FTA) has determined that the construction of the proposed extension of San Francisco Bay Area Rapid Transit District (BART) line to the San Francisco International Airport and Millbrae (BART-SFO Extension), will have an effect on the Cut Stone Bridge, a property eligible for the National Register of Historic Places, and has consulted with the California State Historic Preservation Officer (SHPO) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, the San Mateo County Transit District (SamTrans), as the future owners of the property, and BART have participated in the consultation and have been invited to concur in the Memorandum of Agreement;

NOW, THEREFORE, FTA and SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

The FTA shall ensure that the following measures are implemented.

1. Prior to any impacts to the Cut Stone Bridge, BART shall arrange to have an Historic American Engineering Record (HAER) prepared in accordance with National Park Service standards. BART shall ensure that unless otherwise agreed to by the National Park Service, all documentation would be completed and accepted by the National Park Service prior to any dismantlement and that copies of this documentation are made available to both to the SHPO and the City of South San Francisco.

2. An expert professional stone mason will be hired by BART to supervise the dismantlement of the headwalls of the Cut Stone Bridge. The professional stone mason would ensure that the dismantlement would be handled in such a way that the visible headwall can be reconstructed following BART construction. The northern headwall is now covered and only presumed to be intact. Determination of whether this wall can be dismantled and reconstructed would be ascertained when uncovered by BART construction.

3. BART would construct a new concrete bridge over its cut and cover alignment at the current location of the historic bridge. The southern headwall of the 1863 bridge would be reconstructed under the supervision of the stonemason, integrating it into the new concrete bridge. The concrete bridge would not be visible, and BART would replace the existing stones so that the southern side of the new bridge looks virtually the same as the existing structure.

4. BART would provide a marker or display identifying the bridge location and its historical significance. BART, SamTrans, and other members of a bike path planning committee, if established, would work to integrate the bridge into a bike path if implemented, including incorporating this marker display as part of the bike path.

5. Failure to carry out the terms of this agreement requires that FTA again request the Council's comments in accordance with 36 CFR 800. If FTA cannot carry out the terms of this agreement, it will not take or sanction any action or make any irreversible commitment that would result in adverse effect to the historic property or would foreclose the Councils consideration of modifications or alterations to the undertaking.

6. If any of the signatories to this agreement believe that the terms of the agreement cannot be met, or that an addendum to the terms of the agreement must be made, that signatory shall immediately notify the other signatories and request consultation to consider an amendment or addendum to this agreement. The process of amending the agreement shall be the same as that exercised in creating the original agreement.

7. Should the SHPO or Council object within 30 days to any actions proposed pursuant to this Memorandum of Agreement, FTA shall consult with the objecting party to resolve the objection. If FTA determines that the objection cannot be resolved, FTA shall request the further comments of the Council pursuant to 36 CFR Section 800.6. Any Council comment provided response to such a request will be taken into account by the FTA in accordance with 36CFR 800.6(C) (2), with reference only to the subject of the dispute; the FTA's responsibility to carry out all actions under this agreement that are not the subject of the dispute will remain unchanged.

* * * *

Execution of the Memorandum of Agreement evidences that FTA has afforded the Council a reasonable opportunity to comment on the undertaking and its effects on an historic property and that FTA has taken into account the effects of its undertaking on the historic property.

FEDERAL TRANSIT ADMINISTRATION

By: ______________________________ Date: __________

Title: ______________________________

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

By: ______________________________ Date: __________
California State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

ACCEPTED

By: ______________________________ Date: __________
Executive Director
Advisory Council on Historic Preservation

Concur:

BAY AREA RAPID TRANSIT DISTRICT

By: ______________________________ Date: __________

Title: ______________________________

SAN MATEO COUNTY TRANSIT DISTRICT

By: ______________________________ Date: _________

Title: ______________________________

Memorandum of Agreement
Submitted to the Advisory Council on Historic Preservation
Pursuant to 36 CFR Part 800.6 (a)

WHEREAS, the Federal Transit Administration (FTA) has determined that the construction of the proposed extension of San Francisco Bay Area Rapid-Transit District (BART) line to the San Francisco International Airport and Millbrae (BART-SFO Extension), will have an effect on the Cut Stone Bridge, a property eligible for the National Register of Historic Places, and has consulted with the California State Historic Preservation Officer (SHPO) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, the San Mateo County Transit District (SamTrans), as the future owners of the property, and BART have participated in the consultation and have been invited to concur in the Memorandum of Agreement;

NOW, THEREFORE, FTA and SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

The FTA shall ensure that the following measures are implemented.

1. Prior to any impacts to the Cut Stone Bridge, BART shall arrange to have an Historic American Engineering Record (HAER) prepared in accordance with National Park Service standards. BART shall ensure that unless otherwise agreed to by the National Park Service, all documentation would be completed and accepted by the National Park Service prior to any dismantlement and that copies of this documentation are made available to both to the SHPO and the City of South San Francisco.

2. An expert professional stone mason will be hired by BART to supervise the dismantlement of the headwalls of the Cut Stone Bridge. The professional stone mason would ensure that the dismantlement would be handled in such a way that the visible headwall can be reconstructed following BART construction. The northern headwall is now covered and only presumed to be intact. Determination of whether this wall can be dismantled and reconstructed would be ascertained when uncovered by BART construction.

3. BART would construct a new concrete bridge over its cut and cover alignment at the current location of the historic bridge. The southern headwall of the 1863 bridge would be reconstructed under the supervision of the stonemason, integrating it into the new concrete bridge. The concrete bridge would not be visible, and BART would replace the existing stones so that the southern side of the new bridge looks virtually the same as the existing structure.

4. BART would provide a marker or display identifying the bridge location and its historical significance. BART, SamTrans, and other members of a bike path planning committee, if established, would work to integrate the bridge into a bike path if implemented, including incorporating this marker display as part of the bike path.

5. FTA shall require notification from BART as soon as practicable if it appears that the BART-SFO Extension will effect a previously unidentified property that may be eligible for inclusion in the National Register or affect a known property in an unanticipated manner. FTA may require BART to stop construction in the vicinity of the discovery and will require the project applicant to take all reasonable measures to avoid or minimize harm to the property until FTA concludes consultation with the SHPO. If the newly discovered property has not previously been included in or determined eligible for the National Register, FTA may assume that the property is eligible for the purposes of this Memorandum of Agreement. FTA will notify the SHPO at the earliest possible time and consult to develop actions that will take the effects of the undertaking into account. FTA will notify the SHPO of any time constraints, and FTA, BART, and the SHPO will mutually agree upon timeframes for this consultation. BART may participate in this consultation. FTA will provide the SHPO with written recommendations that take the effect of the undertaking into account. If the SHPO does not object to FTA's recommendations within the agreed upon timeframe, FTA will require BART to modify the scope of work as necessary to implement the recommendations.

6. Failure to carry out the terms of this agreement requires that FTA again request the Council's comments in accordance with 36 CFR 800. If FTA cannot carry out the terms of this agreement, it will not take or sanction any action or make any irreversible commitment that would result in adverse effect to the historic property or would foreclose the Councils consideration of modifications or alterations to the undertaking.

7. If any of the signatories to this agreement believe that the terms of the agreement cannot be met, or that an addendum to the terms of the agreement must be made, that signatory shall immediately notify the other signatories and request consultation to consider an amendment or addendum to this agreement. The process of amending the agreement shall be the same as that exercised in creating the original agreement.

8. Should the SHPO or Council object within 30 days to any actions proposed pursuant to this Memorandum of Agreement, FTA shall consult with the objecting party to resolve the objection. If FTA determines that the objection cannot be resolved, FTA shall request the further comments of the Council pursuant to 36 CFR Section 800.6. Any Council comment provided response to such a request will be taken into account by the FTA in accordance with 36CFR 800.6(C) (2), with reference only to the subject of the dispute; the FTA's responsibility to carry out all actions under this agreement that are not the subject of the dispute will remain unchanged.

* * * *

Execution of the Memorandum of Agreement evidences that FTA has afforded the Council a reasonable opportunity to comment on the undertaking and its effects on an historic property and that FTA has taken into account the effects of its undertaking on the historic property.

FEDERAL TRANSIT ADMINISTRATION

By: ______________________ Date: MAY 9 1996

Title: Regional Adminstrator

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

By: ______________________ Date: May 6, 1996
California State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

ACCEPTED

By: ______________________ Date: 5-10-96
Executive Director
Advisory Council on Historic Preservation

Concur pursuant to BART Board of Directors certifying and adopting project:

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

By: Richard G White Date: 5/7/96

Title: GENERAL MANAGER

Concur pursuant to SamTrans Board of Directors certifying and adopting project:

SAN MATEO COUNTY TRANSIT DISTRICT

By: Gerald T Haugh Date: 5/9/96

Title: GENERAL MANAGER

Final Relocation Plan

Final Environmental Impact Report/
Final Environmental Impact Statement

Final Relocation Plan

January 1996

BART-SAN FRANCISCO AIRPORT EXTENSION

Bay Area
Rapid Transit District

U.S. Department of Transportation
Federal Transit Administration

samTrans
San Mateo County
Transit District

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FINAL RELOCATION PLAN SUMMARY

A. Project Assurances

The intent of the Bay Area Rapid Transit District (BART) and the San Mateo Transit District (SAMTRANS) is to assure that:

1. No pre-acquisition occupant will be required to relocate until comparable replacement housing has been made available.

2. No post-acquisition occupant will be required to relocate until adequate replacement housing has been made available.

3. Within a reasonable period of time prior to displacement, comparable or adequate replacement dwellings will be made available or provided for each eligible displaced person. Such availability or provision shall be accompanied by an analysis of the relocation problems involved and a specific plan to resolve such problems.

4. These procedures will be realistic and adequate to provide orderly, timely and efficient relocation of displaced persons and that relocation payments shall be in the amounts required by law for successful relocations.

B. Purpose of Study

The purpose of this study is to provide BART, SAMTRANS, local and state agencies, and the public, including those possibly affected by the project, with information as to what effect a proposed project would have on the residential and non-residential occupants within the proposed project. Specifically, this report is concerned with potential problems caused by the removal of the existing structures and their occupants.

The estimates of residential and non-residential displacements presented in this report should be considered preliminary and subject to change. They are based on an analysis of the engineering and design information available as of January, 1996. Refinements to the proposed right of way and project design will continue to be made until final project clearances and approvals are received. Final determination about the removal of structures located in the periphery of the right of way may not be made until negotiations between BART staff or their consultants and the property owners are completed. Thus, some of the residential units and business establishments identified for displacement in this report may not be displaced by the project, while other residential units or business establishments not identified herein may be displaced.

C. Basis of Findings

The sources used in the preparation of this study were both primary and secondary in nature. They included, but were not limited to, review of publications of public agencies, newspapers, public records, multiple listing services, local rental ad publications, Realtors and review of United States Census data. Surveys were sent or personally delivered to all potential displacees. A compilation of this data follows.

D. Summary of Findings

1. The project alignment is based on the Locally Approved Alternative (LPA) as modified. Station detail and actual design is only about 30% complete. The project extends the end of the system just past the Colma Station to the proposed South San Francisco (Hickey) Station, in subway to the San Bruno (Tanforan) Station, then in subway through San Bruno to a wye which transcends from underground to retained cut and then on aerial structure over the Route 101 right of way to the new proposed International Terminal at SFO, then back on the said alignment and structure in a southerly arch west back across Rte 101 to the proposed Millbrae Station, then at grade for a short distance into the City of Burlingame to the proposed terminus.

2. Estimated Displacements (expressed in units):

Property Type	LPA (Modified)
1. Residential Owner Occupants	3
2. Residential Tenant Occupants - SFR	3
3. Residential Tenant Occupants - Apts	193
4. Mobile Home Occupants	39 temporary
5. Non-profit Organizations	0
6. Non-residential	14 and storage units
7. Total displacements =	199 households, 14 businesses plus storage

2. (A) Estimated Displacements by City:

Name	Residential Units	Businesses
South San Francisco	**2**	**4**
San Bruno	**0**	**3**
Millbrae	**197**	**7 and storage units**
Totals	**199**	**14 plus storage units**

3. Adequate relocation resources exist for:

Owners	Yes_X__	No___
Tenants	Yes_X__	No___
Mobile Homes.	Yes ____	No_N/A
Non-profit	Yes ____	No_N/A
Non-residential	Yes _X_	No ____

4. The displacement neighborhood and relocation areas are comparable in terms of amenities, public utilities, accessibility to public services, transportation and shopping facilities:

Yes __X__ No___

5. The relocation resources are affordable to displacees given the use of supplemental housing, rental and super payments.

Yes__X_ No___

6. Are there public projects in the area that will displace other families or make additional housing available concurrently with the subject project?

Yes__X*_ No___

*Various street overcrossing and local projects which will have no significant reduction in the housing stock for which the displacees on this project may be directly competing.

7. BART/SAMTRANS' Relocation Program is adequate to successfully relocate all displacees.

Yes__X_ No___

8. Estimated displacement period: 24 months maximum

9. There are special/significant relocation problems associated with this project.

Yes_X*__ No___

*Overcrowding and low incomes occur in at least 65% of the units planned to be acquired. There are four Section 8 recipients, but no Section 8 funds are available to assist other low income displacees unless the Department of Housing and Community Development makes a special allocation of certificates for this project.

10. Low or moderate income housing stock is significantly affected by this project.

Yes__X__ No___

11. The last resort housing program will most likely be required to relocate some households being displaced.

Yes__X (65%)__ No___

12. The last resort housing program will require:

Payments . . . . Yes__X__ No___
Construction. . . . . Yes_____ No_X_

13. A field office may be required for this project.

Yes__X__ No___

14. A no re-rent policy is recommended for this project.

Yes__X_ No___

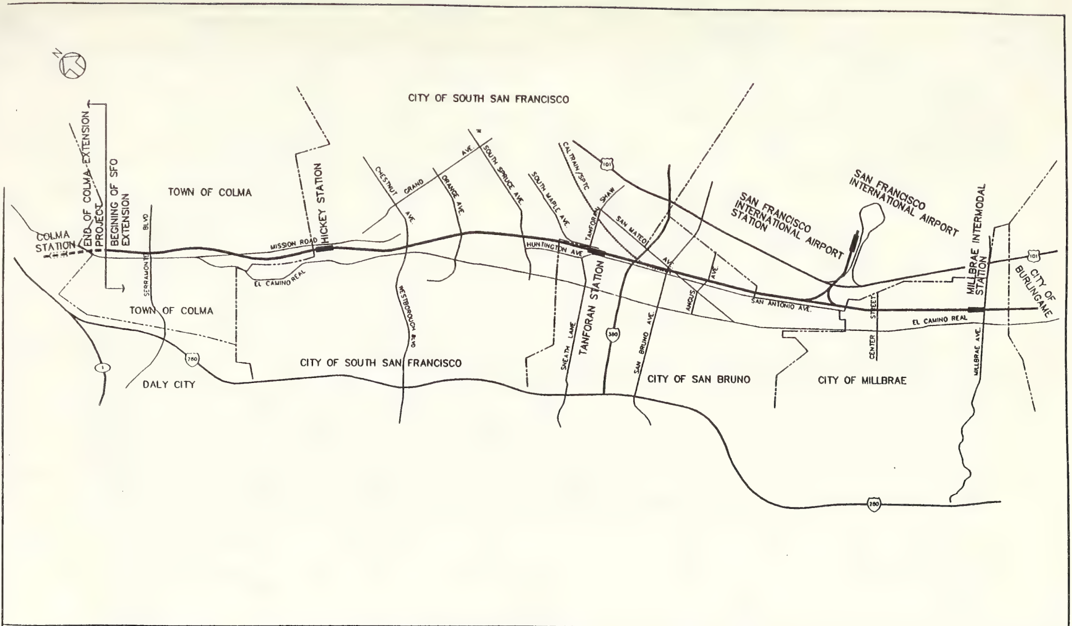
15. Total estimated project funding liability for relocation assistance payments, exclusive of overhead and administration:

Residential Displacements $3,814,000

Business Displacements $1,176,000

Total Relocation Costs including temporary relocations and storage relocations

$4,990,000



BART

SAN FRANCISCO AIRPORT EXTENSION
FEIR/FEIS
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

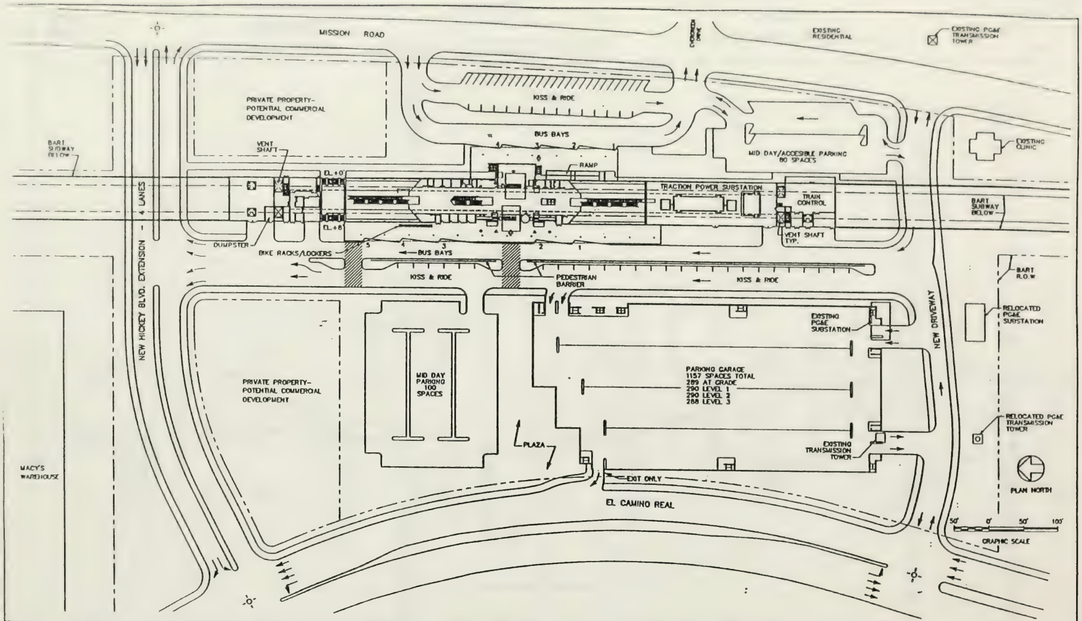
BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-1000-WARREN

1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION LPA
LOCATION MAP

NOT TO SCALE

FIGURE LPA
DATE: 23FE96



BART

SAN FRANCISCO AIRPORT EXTENSION
FEIR/FEIS
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

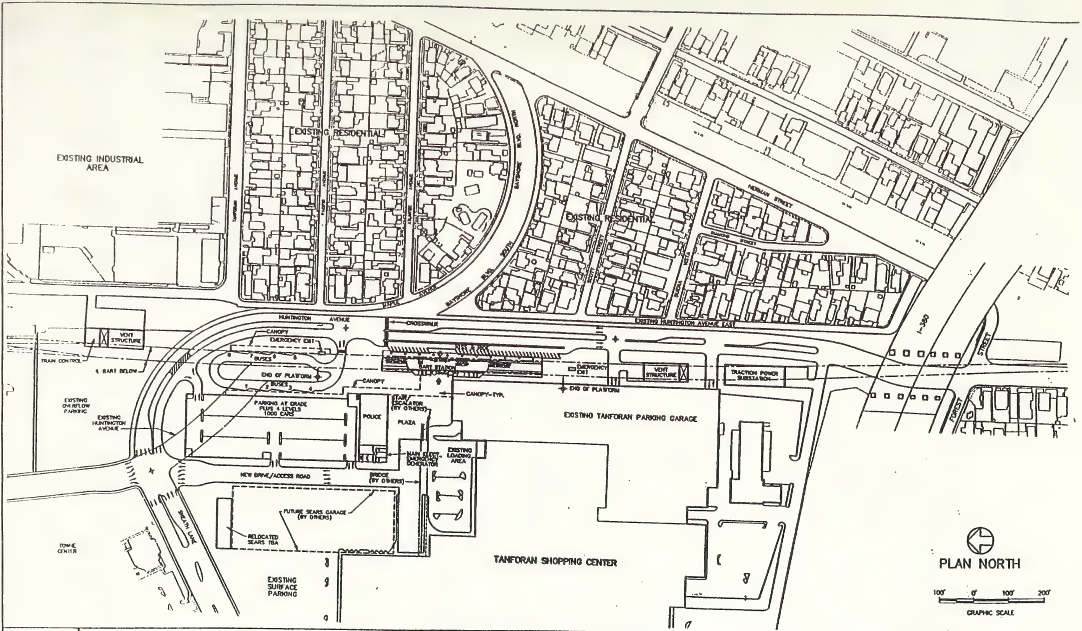
BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-[illegible]-[illegible]

1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

SAN FRANCISCO AIRPORT EXTENSION
HICKEY STATION
SITE PLAN
(SOUTH SAN FRANCISCO STATION)

1" = 100'-0"

FIGURE 1
DATE:



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BART

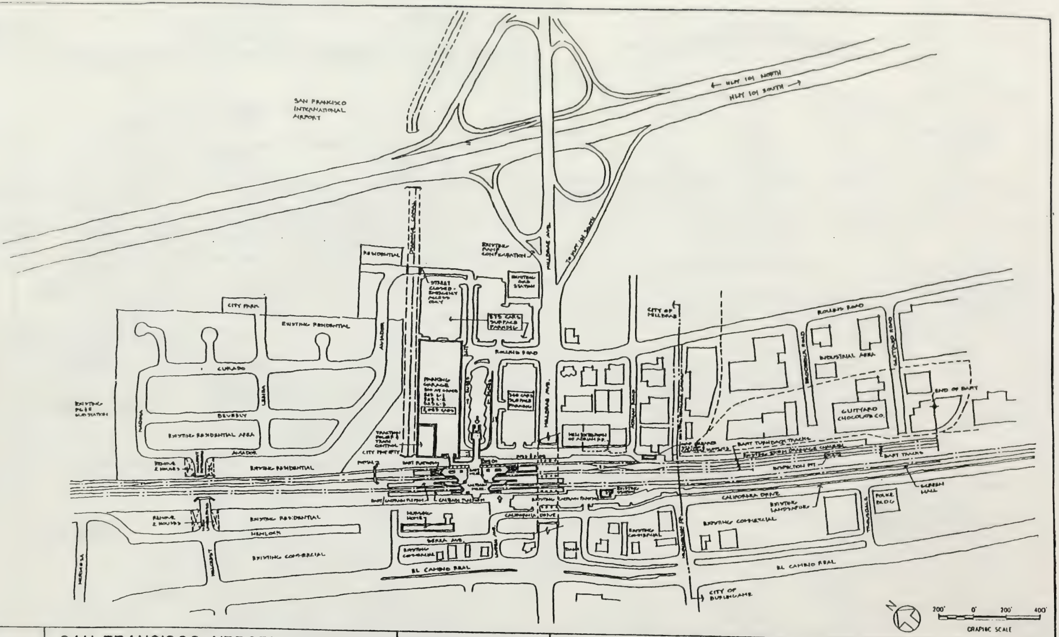
SAN FRANCISCO AIRPORT EXTENSION
FEIR/FEIS
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL–PARSONS BRINCKERHOFF–TUDOR–BARRERA
1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

SAN FRANCISCO AIRPORT EXTENSION
TANFORAN STATION
SITE PLAN
(SAN BRUNO STATION)

1" = 100'-0

FIGURE 3
DATE:



BART

SAN FRANCISCO AIRPORT EXTENSION
FEIR/FEIS
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TUDOR-WARREN
1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

SAN FRANCISCO AIRPORT EXTENSION
MILLBRAE STATION
SITE PLAN

SCALE: 1"=200'-0"

FIGURE 8
DATE:

OVERALL PROJECT DESCRIPTION - ALIGNMENT

The proposed project would start in the Town of Colma at the end of the Colma BART Station tailtrack and would occupy an alignment which extends south in subway via the Southern Pacific Transportation Company (SPTCo) railroad (San Bruno branch) right of way. The alignment would continue one mile before crossing under Mission Road to the Colma/South San Francisco city limits near the future extension of Hickey Boulevard. From the city limits of South San Francisco, the alignment would continue in subway within the SPTCo right of way for about another 1.4 miles, passing through the South San Francisco (Hickey) Station, then under Chestnut Avenue, Twelve Mile Creek, Orange and South Spruce Avenues. The alignment would remain in subway through the San Bruno (Tanforan) Station to Angus Avenue. South of Angus Avenue, the BART subway alignment would transition from the west to the east side of the CalTrain tracks and continue in subway to Georgia Avenue.

An east-west aerial wye-stub perpendicular to the CalTrain mainline would terminate with a station at the planned Airport International Terminal, proposed by the San Francisco International Airport (SFIA). Between Georgia Avenue and San Felipe Avenue, the north leg of the wye would divide from the mainline and the two lines would rise parallel to each other in retained cut. South of San Felipe Avenue, the mainline would continue south parallel to the CalTrain tracks to the Millbrae Avenue Station and the north leg of the wye-stub would curve east and rise via an aerial structure to the Airport International Terminal Station. Between San Felipe Avenue and the San Bruno/Millbrae city boundary, south of Santa Helena Avenue, the mainline tracks would be at grade. Between San Felipe Avenue and Santa Lucia Avenue, the north leg of the wye would rise on columns and curve southeast. From Santa Helena Avenue to the south boundary of Lomita Park School, the mainline tracks would be at grade and the eastbound and westbound tracks of the south leg of the wye would descend on aerial columns, curve to the southwest over the mainline tracks, and descend to grade. South of Lomita Park School, the mainline and the south leg of the wye would descend parallel to each other in retained cut and enter a subway portal approximately 300 feet north of Madrone Street.

The BART alignment would be in subway between north of Madrone Street and San Rey Avenue and then would rise in retained cut to grade 200 feet north of the Millbrae Avenue Station. South of the Millbrae Avenue Station, an at-grade turnback/tailtracks would extend a total of 2,200 feet, of which 700 feet would lie within Millbrae. The turnback/tailtracks with storage for up to 60 BART cars would continue within the SPTCo/CalTrain right of way for approximately 1,500 feet into the City of Burlingame. A fourth track has been added to this facility to accommodate a BART/CalTrain cross platform transfer and the shuttle train to/from the SFIA. This fourth track for the shuttle train would extend about 500 feet into Burlingame.

OVERALL PROJECT DESCRIPTION - STATIONS

The South San Francisco (Hickey) Station would be in subway along the SPTCo railroad right of way just south of the proposed at-grade extension of Hickey Boulevard between Mission Road and El Camino Real in South San Francisco. The Hickey Station would have about 1,337 parking spaces (1,100 in a four-level structure and 237 surface spaces).

The San Bruno (Tanforan) Station would be constructed in a subway cut and cover configuration adjacent to the Tanforan Park Shopping Center. Approximately 1,000 parking spaces would be provided on two new levels of the existing Tanforan parking structure.

The Airport International Terminal Station would be adjacent to the proposed International Terminal; no parking for BART patrons would be available at the station.

The at-grade Millbrae Station would provide an intermodal connection among BART, CalTrain, and SamTrans buses. Roughly 3,000 parking spaces would be provided at the Millbrae Station (2,150 in a four-level parking structure and 850 surface spaces). A new one-way southbound circulation street, east of the BART/CalTrain tracks, would connect the BART station front door and parking facilities to Adrian Road, south of Millbrae Avenue.

Parking facilities for disabled persons will be provided at all stations, except the Airport International Terminal, to meet state and federal requirements regarding accessibility.

OTHER TRANSIT AND ROADWAY FACILITIES

Specific transit and road improvements for the project include:

1. The Hickey Boulevard extension connecting El Camino Real with Mission Road on the north side of the South San Francisco (Hickey) Station;

2. A new street connecting El Camino Real and Mission Road on the south side of the South San Francisco (Hickey) Station;

3. For the San Bruno (Tanforan) Station, realignment of Huntington Avenue;

4. For the Millbrae Avenue Station, California Drive would be extended to Linden Avenue adjacent to the station, and egress would be provided from California Drive south bound on a connector road to Adrain Road;

5. Hillcrest Boulevard would be extended under the CalTrain alignment and over BART connecting El Camino Real to Aviador Avenue;

6. Rollins Road, north of Millbrae Avenue, would be widened to provide access to station parking; and

7. Direct access from the proposed Millbrae Avenue overpass westbound to the station parking garage would be provided. The County of San Mateo is currently constructing an overpass that separates Millbrae Avenue from the BART/CalTrain alignment.

PROJECT DISPLACEMENTS

The proposed project would displace a total of approximately 199 residential households located in 208 dwelling units and 14 businesses. A total of 39 households occupying mobile homes would be temporarily displaced. Up to five other businesses and a nonprofit organization may be directly affected by the project, but their displacement is not anticipated at this time.

At the beginning of the project south of the Colma Station, there are 39 mobile homes occupying spaces on the back row of the Treasure Island Trailer Court located at 1700 El Camino Real, South San Francisco. The occupants of these homes would be relocated temporarily to apartments or motels in the vicinity of the park while work is done along the right of way to the rear of these units. It is planned to phase the construction so all of the home occupants would not have to be temporarily relocated at once. Care would be necessary because nearly all of the occupants are over 65 years of age. Permanent relocation would be out of the question because of the ages of the occupants, the age of the mobile homes, and the general scarcity of available mobile homes in parks in this vicinity. It is assumed the space rents while the construction is proceeding will be paid to the park owner by BART/SAMTRANS while the occupants are out of the park.

On the site of the South San Francisco (Hickey) Station, there are four operating businesses and two households in single family homes which would be displaced. The businesses are a cement contractor's storage yard, a general contractor's office and equipment storage yard, a distributor of Mexican food and a deli. Both residences are tenant occupied. It is not anticipated there would be a problem relocating these tenants to decent, safe and sanitary new housing units which would meet their needs and would be within their financial means given the relocation assistance payments available to them. The business tenants all appear to currently pay rents below the market in the area. This fact would qualify these tenants for the maximum re-establishment payment in some cases. However, they would probably lack sufficient funds to make the necessary tenant improvements to their new replacement leased premises to make them more suitable for the business. All efforts would be made to minimize this impact on these businesses. For example, a different location may provide for more business or a reduction in costs which could offset the higher rents.

Between the new South San Francisco Station and Chestnut Avenue, there is only one business which would be affected by the proposed construction such that they must relocate. Because of the undergrounding of the tracks, this area will be opened during construction. Areas would be needed for "contractor lay-down areas". A retail auto center is using some areas needed for these purposes. The auto dealer uses some of the area for parking of their inventory and for employee parking. They may be able to temporarily utilize other areas they have leased from the San Francisco Water District. They would be able to move autos around during construction to areas not needed for immediate construction. A small restaurant building would have to be removed, as would a small portion of some nursery buildings, as part of construction. The rental rate would probably increase as a result of the restaurant's relocation, but they are also interested in increasing the size of their facility as a result of the relocation. The nursery currently occupies some of the right of way, but the areas needed for construction will not significantly impact this business to the point where it would have to relocate. The adjoining real estate office would not have to stop operation since only a small portion of their parking may be only temporarily affected. They use at least six parking spaces on the nursery property.

South of the intersection of El Camino Real and Chestnut Avenue is a car wash and service station. It is assumed neither of these businesses would have to relocate since the project construction is currently not anticipating the removal of these buildings. These improvements lie partially on SF Water District property which would be purchased by BART/SAMTRANS as part of this project. The project construction may affect the rear portions of these commercial properties, but it is expected to be temporary in nature and not intrusive to the buildings themselves.

Where the proposed project right of way crosses Orange Avenue, a Boys and Girls Club building is located west of the right of way and north of Orange. The parking area in front of this building would be required for this project during construction. Their direct vehicular access off Orange would be eliminated and would be replaced by access from C Street. Additional parking is proposed during construction off C Street which would, after construction, be expanded to provide additional parking for this center. It is assumed this organization would not have to be relocated.

There is a portion of a building located on SF Water District property at Spruce Avenue occupied by a credit union. It is located west of the right of way and south of Spruce. It is assumed this office would need to be relocated. A small office in the vicinity (Perhaps near Tanforan Park Shopping Center) would suit their needs.

At the San Bruno Station at Tanforan Park Shopping Center, the parking areas for the new station would require the relocation of the Sears Auto Center in the northeast portion of the property. This building could be rebuilt and the actual business relocated to it on a portion of the remainder of the site.

Between Huntington Avenue and the proposed right of way to the north of San Bruno Avenue is a rental car agency which would have to be acquired as part of the project. This business owner has indicated a desire to move out of the County. Suitable locations are likely to be available for this business, but at much higher lease rates. The San Bruno Lumber property across the right of way would not have to be relocated as part of this project.

A number of parking spaces currently used for a card room, bar and restaurant business in San Bruno will be affected by the alignment between Huntington Ave. and the San Bruno CalTrain Station. These spaces would be temporarily replaced by alternate parking over seven stages of construction. Of 272 existing spaces, the greatest number of parking spaces temporarily taken out would occur in Stage 4 of the construction, when 100 stalls would be temporarily be replaced by 150 spaces. These temporary parking spaces would be supplied at the existing San Bruno CalTrain Station, which would be temporarily relocated during construction, along Huntington Ave. in this vicinity, and along Huntington Ave. north of San Mateo Ave. By Stage 7, the parking on Huntington Ave. in this vicinity would be fully restored to the existing conditions prior to construction.

As part of the construction of the Millbrae Station, a total of 202 apartment units, four single family dwellings and seven businesses, five of which are located in the apartments themselves as in-home businesses, would have to be relocated. While three of the four single family units affected are owner occupied, the fourth is occupied by a sibling of the owner. It is anticipated replacement housing for these units would be available within the City of Millbrae.

The number of apartment units being affected is, however, of major concern. Their purchase and removal for the proposed project would have a significant impact on the low cost housing stock of apartments in the City of Millbrae, if not in San Mateo County generally. Finding units suitable for the apartment occupants would be more difficult not only because of the large numbers involved compared to the vacancy rate in the City of Millbrae, but also because of the apparent overcrowding and low incomes of the households involved (See Residential Displacements -Survey Results Section).

The five in-home businesses run from these apartment units would also need accommodations in their replacement dwellings. Unless these businesses rely directly on the occupants of the apartment units themselves, it is anticipated there will be no significant problems finding replacement sites for these businesses. It is also expected these businesses would not require special structural modifications which could not be accomplished in the replacement dwelling units.

Also within this station parking area is a major rental car company office, maintenance yard and sales outlet. This business is the most significantly impacted large business in the proposed project. While the business manager indicated the need for at least a ten-acre replacement site close to the airport, the chances of finding this large site fully improved is remote. There are, however, some smaller improved sites very near the current location which may be suitable (i.e., the Dankin property.) The relocation costs for this business will be substantial considering the office, computer and auto repair and service equipment which must be relocated and reinstalled. Relocation out of the area could also have a significant impact on local sales tax revenues.

Across Millbrae Avenue from the proposed parking area for the Millbrae Station is a building which houses 554 individual storage units for dry, secure storage of personal property. The building also houses 372 units of individual wine storage in a section which keeps the bottles at an optimum storage temperature at all times. Only a portion of this building would have to be cut off so an exit road could be built which would connect the proposed station parking area via Adrian Road and Rollins Road to Millbrae Avenue. The road would also serve as a drop-off point for passengers under the new Millbrae Avenue overcrossing. However, the portion of the building severed is vital to the operation of the storage unit itself since the access hallway to the wine storage and the elevators to the second floor of storage are within the area proposed to be severed. It is anticipated the costs of such a reconfiguration of the operation would be uneconomic even if the necessary items were reoriented and the storage expanded into the vacant portions of the building. It is assumed for this plan the building would be purchased in its entirety and all would have to be relocated.

San Mateo County Demographics and Social-economic Characteristics

The County of San Mateo had a population growth in the decade between 1970 and 1980 of about 5.6%. In the decade 1980 to 1990, the growth had risen to 10.6%. It is estimated the population of the County has grown by 5.6% from 1990 to 1994. This translates from a 1990 US Census total population of the County as 649,623 to the 1994 total being estimated at 686,500 persons.

The following table show the 1990 population characteristics of San Mateo County and the areas within the County affected by the proposed project.

	White	Black	Native Amer.	Asian	Hispanic	Pacific Islander	Other
San Mateo County	466,855	35,383	2,987	100,521	114,627	8,760	35,187
Millbrae	15,972	235	51	3,185	2,279	262	707
San Bruno	27,904	1,589	293	5,917	7,252	1,070	2,188
S. San Francisco	33,398	2,172	357	12,181	14,731	1,187	5,017

Housing of San Mateo County and the affected Cities are shown in the following table.

	Total # of Housing Units	Owner Occupied	Tenant Occupied	# of Vacant Units	Vacancy Rate	Median Home Price	Median Rental per mo.
San Mateo County	251,782	145,552	96,362	9,868	3.9%	343,900	711
Belmont	10,320	5,892	4,213	215	2.1%	408,200	697
Burlingame	12,914	5,872	6,457	585	4.5%	461,500	682
Daly City	30,162	16,855	12,155	1,152	3.8%	272,100	674
Millbrae	***8,158***	***5,087***	***2,846***	***225***	***2.8%***	***410,200***	***770***
Redwood City	26,847	12,946	12,547	1,354	5.0%	349,500	670
San Bruno	15,178	9,150	5,490	538	3.5%	294,600	709
San Carlos	11,338	7,992	3,052	294	2.6%	407,500	744
San Mateo	36,928	18,865	16,615	1,448	3.9%	349,800	738
S. San Francisco	19,081	11,367	7,152	562	2.9%	271,900	670

Employment by business type in San Mateo County is shown in the following table.

	Total # of jobs	Major Industry	# of jobs	# of Firms
San Mateo County	288,955	Business Services	22,469	1,059
Belmont	11,892	Business Services	2,050	51
Burlingame	30,749	Communication	2,827	18
Daly City	19,901	Health Services	2,916	149
Millbrae	6,272	Eating & Drinking Places	1,020	43
Redwood City	32,413	Eating & Drinking Places	2,811	118
San Bruno	13,313	Miscellaneous Retail	2,388	75
San Carlos	15,948	Electronic & Electric Eq.	2,425	11
San Mateo	35,881	Business Services	4,228	143
S. San Francisco	107,796	Electronic & Electric Eq.	11,407	114

RESIDENTIAL DISPLACEMENTS - SURVEY RESULTS

The San Mateo County records and information found in the returned Residential Survey forms provided the following information concerning the occupants and their dwellings in the single family residences proposed for purchase on this project:

OVERALL RESIDENTIAL DISPLACEMENTS BY TYPE								
	Total # of Units	By Size					By Tenure	
		Studio	1-brm	2-brm	3-brm	4-brm	Owner	Tenant
Apartment Units	193 units	3	93	97				193
Single Family Residences	6 units			1	4	1	3	3

SINGLE FAMILY RESIDENTIAL DISPLACEMENTS

The single family residences varied in size from approximately 1,260 to 1,500 sq. ft. They were occupied by 22 people, 14 of which were adults and 8 were children. Although all of the homes appear to be over 25 years old, they are in above average condition from the outside. No interior inspections were made as part of this study. Two households have at least one disabled member. All but one household would relocate near their current location. The last household preferred to move out of the State.

APARTMENT DWELLING DISPLACEMENTS

The occupants of the apartments proposed for acquisition on this project were sent surveys by mail and personally contacted several times in an effort to obtain as much information about their relocation assistance needs as possible for this plan. Based on the 145 survey responses received, there are estimated to be a total of 790 people occupying 193 of the 202 units in the apartment buildings proposed for acquisition. Nine of the units are known to be vacant and padlocked from the outside. There are estimated to be 437 adults and 353 children in these units. This averages 4.09 persons per unit. There are currently estimated to be 125 units which are non-decent, safe and sanitary (DS&S). (The main reason for the unit being non-DS&S is overcrowding in the dwelling.)

Additional tenant survey information follows:

APARTMENT RENTAL RATES PAID					
	$500-599	$600-649	$650-699	$700-799	$800-850
Studio	3				
1 Bd, 1ba	20	18	50	5	
2 Bd, 1 Ba	4*		14	64	15

*Includes one manager who pays only $400/month rent.

Cannot afford current rent (Over 30% of gross income) = 125 households

Units occupied by tenants who share the rent = 26 households

Units occupied by at least one disabled occupant = 17 households

Units occupied by one or more members over 65 = 12 households

Area of relocation preference:

Burlingame - 13
City of San Mateo - 26
No answer or other - 18
Millbrae - 97
County of San Mateo - 13
San Bruno - 13
SSF - 13

Units where income is government subsidized: 15 households (Includes 4 households on Section 8)

Number of households wishing to buy a replacement home: 81

Of an estimated 193 occupied units, surveys were received from approximately 75% of these households. Based on previous experience with similar relocation projects, this is considered to be a high percentage of return. Numbers shown above were extrapolated from the surveys received and applied to the total estimated number of occupied units. One apartment building with 9 units was padlocked from the outside and no persons are in occupancy. Another 6 units (3%) could have been considered vacant, but no additional vacancy rate was estimated in view of the 9 units already vacant.

From the survey forms received, it is estimated 15-20% of the households speak only Spanish, or have a very limited understanding of English. Spanish speaking agents will be assigned to assist these families. Relocation claim forms and brochures will be provided in Spanish, as needed, for these households.

Where possible and desired by the occupants, households would be allowed to use their rent differential entitlements as down payments to purchase replacement housing.

NONRESIDENTIAL DISPLACEMENTS

An estimated fourteen businesses would be displaced by the proposed project. Additionally, five business operations will be temporarily affected. Based on the surveys received and general knowledge of the businesses being displaced, it is estimated they currently generate gross annual sales over $15 million, have a monthly payroll over $300,000, and employ over 175 people.

The San Mateo area commercial availability have been recently experiencing a scarcity of new lease space for types of businesses being displaced generally by the project. Compared to 5-10 years ago when commercial space was plentiful, the market now is extremely tight. Large acreage vacant land is almost non-existent. Larger commercially zoned properties are for sale in the $12-15/sq. ft. range. Improved commercial properties rent in the range from $1.20 to $2.25 per sq. ft. Industrial buildings rent in the range from $0.60 - $0.85 per sq. ft. Yard area in industrial areas rent for $0.20 - $0.30 per sq. ft., but many times the extra yard space is included with the building rent with some incremental added for an abundance of extra yard space. All of the businesses surveyed who were willing to state their rent indicated they paid rents less than $1 per sq. ft. of building area leased. Normally these rates for retail space are not available today.

At the South San Francisco Station site, there is a general contractor, a deli, a Mexican food distributor and a cement contractor using property proposed for acquisition. A wholesale produce company appears to have closed their doors recently, but their inventory remains in the building. All of these business owners wish to remain in the South San Francisco area, if possible. While these businesses appear now to be viable, the fact they will have to pay a substantial increase in rent at any replacement location will place some financial burden on them if they are to successfully relocate. These may be partially overcome by the Business Relocation Assistance Program as described in the Appendix of this report, but it is possible some financial hardships must be endured. It is possible the deli, for example, could easily find a replacement location, but in a different neighborhood. This will require more advertising and a more prominent location. There is no doubt the owner will have to pay a higher rent at this new, more prominent location, but it may take some time to attract business in a sufficient volume to overcome the increased operating costs. The Relocation Act provides for rent differential payments in the "Reestablishment" Costs provisions. These should assist this business to overcome these increased operating costs. The other businesses need to find business sites which are closer to their business locations, if possible, in order to offset the increased costs of operation anticipated by the increased rents they are expected to have to pay.

There are three businesses being definitely displaced by the proposed project between the South San Francisco Station and the Millbrae Station sites. One is a Filipino restaurant, and the other is a credit union office. While the restaurant wishes to expand their business at a new site, they have to remain in the area so they can best serve their current clientele. It is expected they will have to pay a higher rent not only because they want a larger dining area, but because of the increased rental rates for commercial properties that are currently available. They may also look into more prominent sites to increase their clientele and offset these increased costs in the long run. The Relocation Payments Program for Businesses will definitely help defray some of these increased costs, but creating the special atmosphere they currently have will be very costly. The current restaurant is improved throughout its interior with imported bamboo panels and beveled glass windows. Moving these will be expensive and necessary to the continuation of the atmosphere at the new site which was so well created by the owner at the old location. If an existing kitchen is not available at the new site, the old equipment will also have to be moved. However, these expenses should be reimbursed by the Relocation Program.

The credit union office is for the use of the nearby manufacturing plant. The area occupied is estimated to be under 500 square feet, and should be able to be relocated in the vicinity with little problem except the increased rent.

The last business definitely displaced in this area by the proposed project is an auto rental agency located at the northeast corner of Huntington Ave. and San Bruno Ave. in San Bruno. This business owner desires a location near access to public transportation, preferably mass transit, because his customers generally do not have their own automobiles. A search area may include all of the peninsula area including San Francisco. Again, it is very probable the monthly rent for a replacement business location will be much higher than is currently paid. It is anticipated a better location will offset these increased costs with increased exposure and a more convenient location to the business customers. It is anticipated the Relocation Assistance Payments Program for Business will nearly cover the anticipated relocation costs of this business.

At the Millbrae Station site, there are a total of seven businesses which must be displaced by the proposed project. Five of these are in the apartments of the households being displaced. There are no significant problems anticipated by these relocations. These businesses by their nature do not require much space and do not rely on "walk-in" traffic.

By far the most significant business to be relocated is the rental car agency located off Millbrae Ave. While no survey was returned from them in time to be covered in this report, a review of the site was made. A significant amount of area is needed by this business since they have offices, an auto sales lot and an auto repair facility at the same location. They appear to also use the site to temporarily store some of their new cars before they go to their rental outlet location. As a result, they have indicated they need a replacement site of at least ten acres in size. The size may be offset if the company wishes to build the necessary parking structures needed to handle the volume of automobiles they anticipate. Efforts may also be undertaken to consolidate locations or functions if at all possible. Perhaps a moving consultant could be hired by the company to study the alternatives so as to lessen the relocation impact. This cost could be reimbursed as part of the moving payments. In any event, this relocation will have to be monitored and carefully assisted every step of the relocation process to insure they and BART/SAMTRANS document all of the relocation payments they are entitled to receive.

The last business to be displaced on this proposed project consists of a storage facility for 554 individual general personal property storage units and 372 individual wine storage units which are kept at the proper temperature and humidity for proper wine storage. Again, no specific survey was received from this business owner, but it is anticipated a great deal of time will be necessary to relocate the individual property from each storage unit. The business itself would be reimbursed through the acquisition process for the improvements made to the building. Since there is evidently a strong demand in this area for these types of storage units, it is anticipated the business owner will replace the facility if any like facility could be found. Relocation expenses for the business above and beyond that provided for in the condemnation provisions of the law are anticipated to be minimal.

On the other hand, the relocation of the personal property and the wine to suitable available storage units may be quite another problem. Replacement storage and wine storage space is almost non-existent in this market. Areas with some storage have a low vacancy rate and are outside the a comfortable traveling distance for those patrons in this storage facility. However, many persons who store their household goods may be quite removed from where their goods are stored. This fact also complicates the relocation of these goods to new storage units. At the present time, there is no other wine storage facility in the peninsula area. It is assumed the business owner would recognize this market and reestablish the storage facility in this area. Timing the relocation to the benefit of BART/SAMTRANS and the business owner would be necessary to preserve minimum vacancy rates and meet the needs of the storage customers.

HAZARDOUS WASTE OBSERVATIONS

During investigations and property visitations necessary for the preparation of this report, there were no obvious sites where hazardous waste was evident in any measurable quantities to the unaided eye. Where hazardous material, such as gasoline, was being used, it appeared to be properly contained and dispensed.

HOUSING NEEDS

According to the surveys received from the occupants of the single family units which would be acquired for this project, the following replacement dwellings are needed:

SINGLE FAMILY RESIDENCE - HOUSING NEEDS

Type of unit	Displaced	Need
2 BEDROOM, 1 BATH	1	1
3 BEDROOM, 1 BATH	3	3
3 BEDROOM, 2 BATH	1	1
4 BEDROOM, 2 BATH	1	1

According to the surveys received from the occupants of the apartment units which would be acquired for this project, the following replacement dwellings are needed:

APARTMENTS - HOUSING NEEDS

Type of unit	Displaced	Need
Studio Units	3	3
1 bedroom, 1 bath	93	28
2 bedroom, 1 bath	97	81
3 bedroom, 1 or 2 bath	0	51*
4 bedroom, 1 or 2 bath	0	30*

* Does not take into account the possible splitting of some households as discussed below. An accurate determination cannot be made at this time.

As one can see by the above chart, it is estimated almost 42% of the dwelling units planned to be acquired are overcrowded and do not meet decent, safe and sanitary (DS&S) standards. DS&S standards normally require there not be more than two adults or three children in each bedroom. While some of this overcrowding is due to friends and/or relatives sharing quarters and participating in the rent, some is also due to the birth of new siblings.

In some cases it may be possible to move portions of the household into one unit while the other portion of the household rents another unit in the same or a nearby complex or building. This would allow the families to maintain any dependency relationship they had established, and put the entire household in DS&S living quarters.

Where single persons share the rent and cause the overcrowding, the person can relocate to shared quarters and the rest of the family could relocate into similar sized housing with the relocation rent differential payment helping reduce the temporary economic hardship.

Because of this possible splitting of some households, the actual number of dwellings needed may increase, but this will result in the need for more units in the category where the most types of units are available, the two bedroom type. It is not anticipated these divisions of some households will decrease the cost of the relocation project, but will result in the household being possibly more able to afford the housing cost when the 42 month relocation subsidy period ends.

Households occupied by at least one disabled person were mainly interested in being near their doctor's facilities and in a ground level unit. It may take a few months longer to find the right unit which meets the disabled persons' needs, but it is anticipated a sufficient number of units will become available during the relocation period.

RELOCATION AREA

As a result of the relocation area preferences expressed in the survey forms received from the tenants and owners affected by this project, a relocation area was determined as the entire County of San Mateo except the coastal communities, East Palo Alto, Foster City, and the Redwood Shores areas. Emphasis will be placed on the communities of Millbrae, Burlingame, San Bruno, San Mateo and South San Francisco. These areas were specifically preferred by the majority of those who returned their surveys. It is felt these areas will provide the housing stock necessary to satisfy the housing needs of the displaced households recognizing they will need to be within a reasonable commute distance from their employment and within the school districts where their children currently attend school. It is also expected they will be able to find adequate numbers of available housing units to suit their needs which are comparable in size, or larger, and age, or newer, of the units they currently occupy.

HOUSING AVAILABILITY

In order to determine the amount of and type of housing units available in the areas where the project displacees desired to move to, a study was first made of the demographics of the area. This data was reported in the San Mateo County Demographics and Social-economic Characteristics section of this document.

All residential occupants were sent a survey form to determine their current desires and needs for replacement homes (See Residential Displacements - Survey Results Section of this report). As a result of the surveys obtained from the occupants of the affected single family residences, it was concluded that all six owners and tenants should be able to relocate easily within a 90 day relocation period given the availability of homes for sale and lease in the areas into which they desire to relocate. One tenant is disabled and another has two large dogs which must be accommodated. In the first case, a one story dwelling is desirable. In the second case, BART/SAMTRANS may have to pay an additional non-refundable cleaning deposit to the landlord in the replacement dwelling to get them to accept the pets. This tenant expressed a desire to buy a replacement property also. Given the amount of relocation and acquisition payments available to these households, it is expected more than enough homes will be available for their choice in the relocation area.

A search was then conducted of the "For Sale" and "For Rent" ads in the San Mateo Times and the San Francisco Examiner, Peninsula ads. Samples were taken from the first week section every other month for one year. The ads in the "Times" were found to be more plentiful and reliable. Where an apartment building was advertising, a call was made to that manager to discuss the current experience in the market.

As a result of the newspaper ads in San Mateo County (All areas except Pacifica, East Palo Alto and Foster City/Redwood Shores), the following typical availability for a one month period was observed:

<table>
<tr><th colspan="6">APARTMENTS FOR RENT</th></tr>
<tr><th>Type of unit</th><th>$500-599</th><th>$600-699</th><th>$700-799</th><th>$800-899</th><th>$900+</th></tr>
<tr><td>Studio</td><td>6</td><td>3</td><td></td><td></td><td></td></tr>
<tr><td>1 Bedroom</td><td>1</td><td>23</td><td>15</td><td>4</td><td></td></tr>
<tr><td>2 Bedroom</td><td></td><td></td><td>4</td><td>10</td><td>8</td></tr>
<tr><td>3 Bedroom</td><td></td><td></td><td></td><td></td><td>3*</td></tr>
<tr><td>Totals</td><td>7</td><td>26</td><td>19</td><td>14</td><td>11</td></tr>
<tr><td colspan="6">*Those 3-Bedroom apartments which were available were in the range of $1,095 - 1,500/month with most being under $1,300. No 4-Bedroom apartments were found for rent. All figures shown on a monthly basis since it is assumed the units advertised one month were rented prior to the ad date checked two months later.</td></tr>
</table>

The rental rates of the apartments which are planned to be acquired for the Millbrae Station are at or below the average apartment rental market for the Millbrae area. The units in general appear to have some deferred maintenance and the overall management levels seem lax. The units and therefore their occupants in general have a poor reputation with the other members of the community because of the higher than average fire and domestic disturbance calls made in this area. This perception may make it more difficult for some households displaced by this project being considered for an apartment in the City of Millbrae because landlords do not wish to rent to perceived problem tenants. Considering the very low vacancy rates and the lack of other incentives, the market appears to be ruled more by the landlords rather than the tenants at this time. It is also unlikely this situation will change in the near future.

Without sufficient numbers of available larger apartments for those households with over 6 occupants, it is expected houses will have to rented for some of the larger households in order to satisfy the DS&S requirements of the Relocation Act. However, some appear only to have a shared arrangement because of the inability to afford the rent individually. In these cases, additional assistance may be necessary to each new household. For purposes of determining probable availability, it was assumed (Based on the for rent ads in the Times) there would be fifteen 3 bedroom homes and five 4 bedroom homes which would come up for rent in the Relocation Area in an average month. These amounts were conservative in relation to the actual numbers counted.

AFFORDABLE HOUSING

It is evident from the tenant survey returned that some have been required to bring in other individuals to help afford the rental rates they currently pay. This has lead to the overcrowded conditions found in many of the units. It is also evident many of the units are occupied by low to very low income tenants who should qualify easily for Section 8 subsidies if they were available. Because these tenants have resisted rent increases in the past, there are many who are paying affordable, but below market, rates. In this sense, the supply of affordable housing is being taken out of the Millbrae City housing supply. Considering the 1990 Census figure of only 225 vacant units in all of the City, the loss of these 202 units is significant for those tenants who wish to relocate back into this city.

Interviews were also conducted with the San Mateo County Housing Authority, the Millbrae Planning Director, and the Department of Housing and Urban Development. Of major concern were the problems of overcrowding, low incomes and lack of funds for housing programs at the Federal and State levels. These discussions will be mentioned in more detail in the Relocation Plan section of this report.

RELOCATION PERIOD

Because of the relatively tight rental market and the sheer numbers of households involved, a relocation period of 18 to 24 months is recommended. While this may delay the completion of the Millbrae Station, this recommendation is made so these properties may be given top priority in the acquisition schedule so the hardships on the tenants affected can be minimized. A shorter time period would make it very difficult for the approximately 100 households desiring to stay within the City of Millbrae enough time to find an appropriate dwelling for their family.

This lead time may be reduced by several factors. BART/SAMTRANS could advertise daily for “Rentals Wanted” and offer an incentive payment to the displaced household or landlord (See Last Resort Housing Section). These efforts may not work in the City of Millbrae because of the scarcity of available vacant apartments, but should help those wishing to relocate to adjoining communities where more apartments are available.

A second incentive for the tenant to move early is the fact some of the apartments are not properly maintained and the replacement dwellings are usually going to be in better condition. This fact along with the relocation payments program should make the tenant willing to relocate early in the acquisition process. The selection of available dwellings should also be better.

A third factor which could cut this lead time is the fact over 40% of the tenants surveyed said they preferred to buy a replacement dwelling. With falling interest rates now and the market beginning to recover, waiting at this point would only make the house prices rise, thus increasing the likelihood they would have to remain in rental housing.

These factors, combined with the recommended removal of buildings as they are bought and vacated, may reduce the lead time by as much as twelve months.

NEEDS VS. AVAILABILITY ANALYSIS

Assuming a twenty four month lead time, the following chart was constructed. The "Expect to Have Available" figures are based on the average number of units by class determined from the Times ad survey. These numbers were adjusted downward by 15% every six months during the 24 month relocation period to reflect the probable reduction of available rental housing over this period. This represents the anticipated number of units available over the 24 month period with the expectation that the market will become tighter (fewer units will be available). This should compensate for the expected rental housing market conditions.

NEEDS VS. AVAILABILITY

TYPE OF DWELLING UNIT	NEED	AVAILABLE	ANTICIPATED RENTAL RATE
Studio units	3	171	$575-$650/month
1 Bedroom, 1 Bath	28	803	$675-$850/month
2 Bedroom, 1 Bath	81	334	$850-$975/month
3 Bedroom, 1 & 2 bath	51	286*	$950-1,300/month
4 bedroom, 1 & 2 bath	30	95*	$1,250-1,650/month

*Assumes these households will relocated to either apartments, which are in very short supply, or available single family homes which are for rent.

While there appears to be adequate supplies of housing in all categories over the extended relocation period, there are bound to be other families also looking for rental housing in this area competing with the project displacees. This fact, as well as the perceived negative experience these units have experienced, will probably lead to scarcities in the Millbrae area, and possibly the adjacent communities. There may be difficulties in determining the comparable replacement dwelling rental cost where the tenant will only relocate to Millbrae and needs one large, or two smaller units to accommodate the family's size. In these cases, adjustments should be made to the entitlements based on units as they become available so the family can have a good idea of the rental subsidy payments when looking for a new home. It may also be to BART/SAMTRANS' advantage to make advance payments in these situations so the tenant may make the necessary deposits to secure the replacement dwelling as soon as they are sure they want it. Inspections will be made within 24 hours of the agent being called in these cases.

RELOCATION PLAN

The Relocation Assistance brochures found in the Appendix of this report detail some of the specifics of the services and payments available to all persons who are displaced directly as a result of this project. While they do not cover all of the details of the Relocation Act and its implementing administrative regulations, they are in sufficient detail to let all of the persons displaced know what the program procedures are.

Universal Field Services, Inc., is expected to employ no less than four full time Relocation Specialists during the relocation period to assist the residential tenants and owners, and the businesses, locate suitable replacement facilities and apply for the qualified relocation payments. A field office will be established by BART/SAMTRANS in the Millbrae area where agents will be able to assist all displacees. The proposed West Bay Extensions office will be at 979 Broadway, Millbrae, CA 94030. This office is expected to be in operation by June of 1996. The HOT LINE phone number is (415) 398-2002. A more specific office number will be supplied after the new office is opened.

As soon as practical and typically within seven working days of the first written offer to purchase a particular property, the tenants will all be personally contacted to have their relocation assistance benefits explained to them orally and in writing. Their individual needs and desires will be discussed and an offer of assistance will be made to help the household relocate, if necessary and possible, to a dwelling were their needs and desires can be satisfied. At least two bilingual agents fluent in Spanish will be utilized for this effort. Relocation claim forms and brochures shall be provided, wherever necessary, in both English and Spanish. Where no translation in the household's native language is available, a family friend or community advisor will be sought to assist the agent to explain the program provisions to the household occupants.

An official of the San Mateo County Housing Authority and the Federal Department of Housing and Urban Development was contacted regarding the availability of Section 8 certificates for some of our low income families. It was determined that the current occupants on Section 8 may continue at a new dwelling units if the landlord will take them under this program. Those persons who were able to get on the current Section 8 list would move to the top of the list as a result of their being displaced by a public project. However, no new certificates are being issued except in unusual circumstances. As a result of the information supplied in tenant survey forms, it is possible as many as 80-100 households could qualify for Section 8 if a special allocation of certificates could be secured. This possibility should be explored further with the officials of the San Mateo Housing Authority and HUD as soon as possible.

For those individuals wishing to purchase a home, programs and projects in the Cities of Redwood City, South San Francisco, San Mateo and Daly City could assist individuals in obtaining affordable housing. Projects in the City of Redwood City, for example, are in planning for completion in 1997 for 12 units of two and three bedroom condominiums. These units will be available at $132,000 and $168,000 respectively. With the relocation payments which will be available, households in need of further economic assistance may find the purchase option more affordable than previously anticipated. There is also a residence hotel where some of the single displacees could find studio apartments and rooms at affordable rates. All efforts would be made toward finding permanent affordable housing.

Relocation assistance for the affected businesses will consist of help in exploring the available properties on the market with a suitable commercial broker who is knowledgeable in the Peninsula. As part of the relocation payments, experts hired to assist the business owner may be compensated through the relocation payments program for those businesses needing such help and analysis. While the program does not pay normally for real estate brokers' fees, a relocation expert specifically hired just to solicit for a replacement can be compensated as part of the moving expenses. The Relocation Advisor would also solicit available replacement business locations, assist the business owner in making the proper claims for the maximum entitlements allowed and explain all of the procedures necessary to obtain such payments.

It is highly recommended that as buildings and apartments become vacant, even while negotiating for their purchase, the owner of the building refrain from rerenting the vacated units. In this regard, BART/SAMTRANS should be able to pay rent to the owner for the keeping the units vacant while earnest negotiations are being conducted. When the building becomes completely vacant, it should be removed from the property as soon as possible to prevent vandalism, squatters and/or fires. This will prevent low income, non-eligible persons and households from moving into the vacated unit after one household has already been paid and relocated.

LAST RESORT HOUSING

Because of the high number of overcrowded units and the relatively low incomes of the households, it is anticipated over 60% of the displaced apartment dwellers will qualify for rental assistance payments in excess of the statutory limit of $5,250. Because of this, it is expected BART/SAMTRANS will be paying last resort housing payments to over 60% of these tenants.

It is further recommended as part of the Last Resort Housing payments the BART/SAMTRANS payments be made partially in advance and that bonus or incentive payments be made to the tenants and/or the replacement property landlords to encourage a smooth and expeditious relocation process. Where the household income is low, the advance payments could be used to secure replacement dwellings as they are first advertised. Bonus payments to landlords to accept a displaced household could be used when one portion of a family has moved and the other portion of the family needs a unit in the same or a nearby apartment complex because a preexisting dependency relationship between the members of the household. It is also possible the landlord bonus payment can be used as an incentive for the landlord to call the BART/SAMTRANS Relocation Office as soon as they receive notice of a possible vacant unit.

Negotiations will also commence as soon as the project is approved to obtain additional Section 8 certificates from the Department of Housing and Urban Development through the San Mateo County Housing Authority. It is possible BART/SAMTRANS could advance a set amount of funds to HUD for each additional certificate needed. The need for additional certificates would be determined on a household by household basis using certificate qualification criteria established by the San Mateo Housing Authority and HUD.

The possibility of relocating the apartment buildings to vacant sites for rehabilitation and rental to the displaced households on this project has not been considered to not be feasible. The households will have to move prior to the time these units can be made available. Also, since most of the tenants expressed a desire to stay in the City of Millbrae, there are no vacant parcels of sufficient size upon which to move the buildings. The City of Millbrae is currently characterized as a "built-out" City. Therefore, the last resort housing program will consist mainly of payments above the statutory limit, issuance of Section 8 certificates as they can be made available and providing of bonus and incentive payments to assist the relocated households in finding suitable replacement dwellings.

Appendix

PHOTOS OF PROPERTIES WHERE POSSIBLE RELOCATION INVOLVED

PHOTOS OF TYPICAL REPLACEMENT UNITS IN THE RELOCATION AREA

TYPICAL AD FOR AVAILABLE BUSINESS PROPERTIES

Exhibit A - Letter to all Residential Occupants

Exhibit B - Relocation Assistance - Residential: Letter Insert

Exhibit C - Residential Occupant Relocation Assistance Questionnaire

Exhibit D - Letter to all Business Occupants

Exhibit E - Business Relocation Survey

Exhibit F - Residential Relocation Assistance Program - Detailed brochure

Exhibit G - Business Relocation Assistance Program - Detailed Brochure

PHOTOS OF PROPERTIES WHERE POSSIBLE RELOCATION INVOLVED

Mobile home park where temporary displacements are necessary.

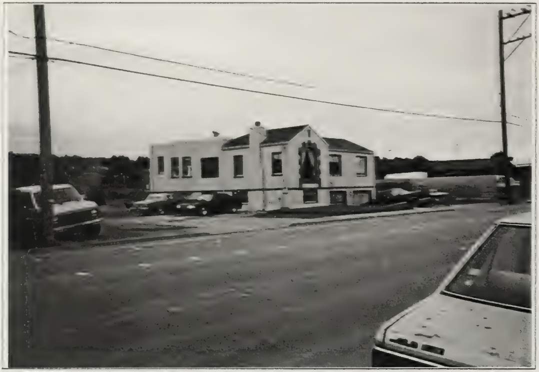
Occupants of mobile homes to the left of photo affected.

Contractor's storage yard next to office on Mission Blvd., SSF.

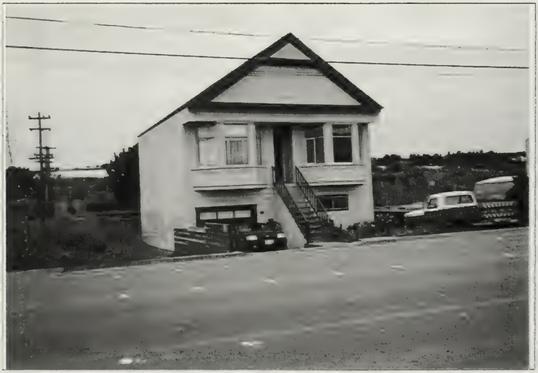
Commercial building needed for South San Francisco Station site.

Another commercial storage building on land needed for the South San Francisco (Hickey) Station.

Cement contractor's storage yard also needed for the South San Francisco (Hickey) Station.



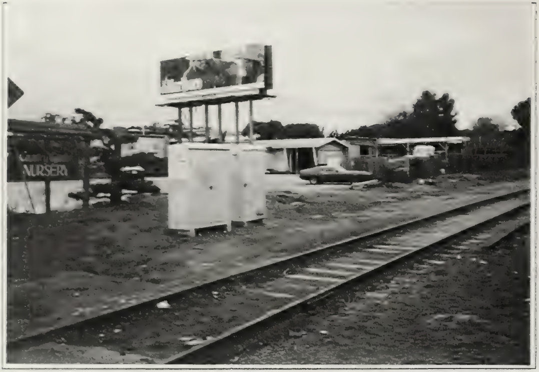
Residence needed for the South San Francisco (Hickey) Station.



Residence needed for the South San Francisco (Hickey) Station.

Parking area for automobile dealership across the street.

Restaurant which would be acquired as part of the project.



Nursery and parking which may be affected by the project.

Credit union building which would be required to move.

Auto center which would have to be acquired at the San Bruno (Tanforan) Station site under the current plans.

Car rental agency site which is needed for the project.

View of the residence located on the northeast corner of Hemlock and Hillcrest, Millbrae. This home must be purchased to provide for the extension of Hillcrest to Aviador.

View of the residence located in the southeast corner of Hemlock and Hillcrest. This home is also required for the extension of Hillcrest to Aviador.

View of one of the apartment buildings which would be purchased as part of the development of the Millbrae Station.

View of the apartment buildings which would be purchased as part of the development of the Millbrae Station.

View of the apartment buildings which would be purchased as part of the development of the Millbrae Station.

View of the apartment buildings which would be purchased as part of the development of the Millbrae Station.

Self storage building which may have to be acquired as part of the Millbrae Station development.

Rental car agency office, maintenance and sales facility which is needed for the Millbrae Station development.

View of the fronts of the two homes required along Aviador. The first home on the right is not needed.

PHOTOS OF TYPICAL REPLACEMENT UNITS IN THE RELOCATION AREA

Condominium units currently available in SSF/San Bruno area.
Listing prices from $190,000 - $230,000+/-.

View of home for sale in SSF for $230,000

View of complex of apartments in San Bruno with a "For Rent" ad.

View of older apartment complex near shopping in San Bruno.

View of apartment buildings where units are available in San Bruno along Linden Avenue, one block off El Camino Real.

View of typical small complexes east of El Camino Real, Millbrae area.

View of typical small complexes east of El Camino Real, Millbrae area.

View of typical small complexes east of El Camino Real, Millbrae area.

View of typical small complexes east of El Camino Real,
Millbrae area.

View of typical small complexes east of El Camino Real,
Millbrae area.

View of typical apartment buildings in the Richmond and Palm Avenue area, Millbrae.

View of typical apartment buildings in the Richmond and Palm Avenue area, Millbrae.

View of typical apartment buildings in the Richmond and Palm Avenue area, Millbrae.

View of typical apartment buildings in the Richmond and Palm Avenue area, Millbrae.

View of typical apartment buildings in the Richmond and Palm Avenue area, Millbrae.

View of typical apartment buildings in the Richmond and Palm Avenue area, Millbrae.

View of typical apartment buildings in the Richmond and Palm Avenue area, Millbrae.

View of single family home for lease in Millbrae.

Starboard Commercial Brokerage

Business Location Guide

CALL US FIRST!
340-7665
http://www.starboardnet.com

We are the Bay Area Business Location Experts. 340-7665

RETAIL

SOUTH SAN FRANCISCO SHOPPING CENTER FOR LEASE
Choose 3,250 SF or 2,445 SF or combine to 5,695 SF, both units have high visibility storefronts, signage and good parking

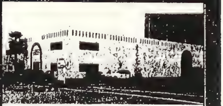
EXCELSIOR DISTRICT RETAIL LOCATION FOR LEASE
3,939 SF, busy area of Mission Street, clean shell, two ADA accessible restrooms, newly renovated, many building upgrades

NEIGHBORHOOD SHOPPING CENTER, BELMONT
390 El Camino Real between Hillsdale Blvd. and Ralston. Ample on-site parking. 1,000 SF to 3,798 SF @ $1.15-$1.25, NNN Monthly.

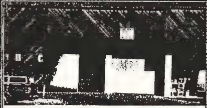
REDWOOD CITY RETAIL OR INDUSTRIAL BLDG FOR LEASE
6,000 SF of ret/indstrl space with 4,000 SF yard space, 2 street access, display windows, roll-up doors, high visibility

INDUSTRIAL

REDWOOD CITY WAREHOUSE & OFFICE SPACE FOR LEASE
1,600 SF of warehouse and a 750 SF office area, off street parking, quick access to 101 & 280 Frwy $0.75 Industrial Gross



VERY ECONOMICAL STORAGE SPACE!
1,500 SF at only $0.44 SF with ground level loading door and 16 FT ceilings. Perfect for a wide variety of storage uses.



REDWOOD CITY WAREHOUSE FOR SUBLEASE
Very clean 3,934 SF warehouse w/16 ft ceiling height, 14 ft roll up door, one sunny private office, sprinklers, security, good loc, great price for remaining term.

VERY CLEAN SAN CARLOS INDUSTRIAL SPACE
9,000 SF divisible to 4,500 SF, warehouse or R&D space, up to 2,300 SF office space, roll up door. Parking. 55¢ gross

We advertise, list with a leader...

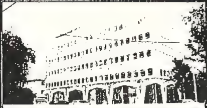
Need Space? Call us first! 340-7665

OFFICE

REDWOOD CITY OFFICE SUITES FOR LEASE
Choose from several small office suites, on-site parking, elevator access, tenant improvements available, easy access to 101 and 280 Fwy.

PROFESSIONAL SAN MATEO OFFICE FOR LEASE
1,700 SF office ideal for medical, dental or general office use Ground level, on-site parking $2,550 per month

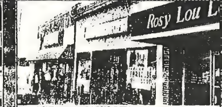
SAN MATEO PROFESSIONAL OFFICES FOR LEASE
1,155 SF office and 726 SF office, great windowline. Convenient downtown location, on-site parking, suites ready to occupy.



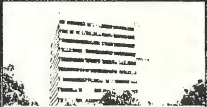
AFFORDABLE SAN MATEO OFFICES FOR LEASE
Choose from 2 suites. New carpet and paint, nice bright natural light, parking in the rear of building, owner pays utilities

BURLINGAME OFFICES FOR LEASE
Quality suite, ready to move in, nice priv. office in well maintained building. 2,806 SF. Low full service rent. Call Now!

PROFESSIONAL REDWOOD CITY OFFICES FOR LEASE
1,825 SF and 525 SF private office, large work area, easy access to downtown Redwood City, off-street parking. Call for rates.



DALY CITY HIGH TRAFFIC RETAIL LOCATION
Retail or office space of 1,400 SF to 2,800 sq ft with rear loading access, large windows with gate, 10 car parking. Move in now.



SOUTH SAN FRANCISCO OFFICES FOR SUBLEASE
3,081 SF suite has bay views and is in move-in condition. Good mix of private offices and open area. Free parking & easy access

340•7665

UNIVERSAL
FIELD SERVICES, INC.

EXHIBIT A

Relocation Specialist
BART/Sam Trans
SFO Extension
240 Tanforan Park
San Bruno, CA 94066
Phone: 415/827-3750
Fax: 415/873-0887

January 8, 1995

Occupant

Dear Occupant:

As you may be aware, the Bay Area Rapid Transit Board of Directors (BART) in conjunction with the San Mateo County Transit District Board of Directors (SamTrans) is working toward a proposed extension of BART to San Francisco International Airport. The SFO extension project, if implemented, is expected to greatly benefit Bay Area residents in many ways, including relief from some of the current and future strain on Bay Area Highways. We are asking you to complete and return the enclosed questionnaire as part of the continuing effort to make this project a reality.

In November of 1995, the locally preferred alternative (LPA) for the proposed project was selected. As a result, it appears that some homes in your area may be affected. BART/SamTrans has selected Universal Field Services, Inc., a firm that specializes in relocation assistance under the Uniform Act, to complete a study to determine what the future housing needs for you and some of your neighbors will be if indeed your homes are affected. Your cooperation in returning the enclosed form is critical in the preparation of the study. The information you provide is absolutely confidential and will not be shared with any other agency or individuals; the only purpose of this questionnaire is to prepare a relocation assistance plan for the benefit of you and your neighbors in the event that your homes are affected by this project.

If your home is acquired as a result of this project, you will be entitled to certain benefits provided under the Federal Uniform Relocation Act, a federal law designed to help individuals and businesses that are displaced due to such projects. A basic outline of those benefits is enclosed. Completion of the questionnaire will help us determine any benefits to which you may be entitled if your home is acquired. Every question on the form is relevant to the study and/or helping us determine what benefits you may be entitled to receive; therefore, please take the time to answer each question accurately. A self-addressed, stamped envelope is included for your convenience.

Thank you in advance for completing and returning the enclosed questionnaire. If you have any questions about the enclosed documents or the proposed project, do not hesitate to call or visit the project office located in the Tanforan Park Shopping Center (upper level, facing El Camino Real above Walgreens, next to Sears). The phone number at the project office is (415) 827-3750.

Sincerely,

C. David Hulbert
Relocation Specialist

EXHIBIT B

RELOCATION ASSISTANCE - RESIDENTIAL

If you are required to move as a result of a federally assisted project such as the proposed BART/SamTrans SFO Extension Project, you may be entitled to benefits as outlined in the Uniform Relocation Act as amended in 1987. The relocation assistance program will involve providing each affected displacee with financial and advisory assistance. The needs of each displacee will be carefully analyzed to determine what specific benefits and services are required. The following is a brief summary of the possible benefits to which you may be entitled if you remain in occupancy of a dwelling that is affected by the project.

Moving Cost Reimbursement: If you qualify as a displaced person, you will be entitled to reimbursement of the moving costs and certain related expenses incurred while moving from your home. Displaced families may choose to move themselves and to be paid according to a fixed moving cost schedule or to hire a commercial moving company and to be paid based on the actual, reasonable moving costs and related expenses. Note: **Do not schedule a move without contacting the project office because moving prior to the initiation of negotiation will affect your eligibility for benefits.**

Replacement Housing Payments: There are three types of replacement housing payments (RHP) - a purchase supplement; rental assistance: and down payment. The type of RHP depends on whether you are an owner or tenant as well as how long you have lived in the dwelling prior to the initiation of negotiations.

> Purchase Supplement: If you own your home and have lived there for 180 days or more immediately prior to the initiation of negotiations, you may be eligible for a supplemental payment for all costs to purchase a comparable decent, safe and sanitary replacement dwelling. (This is in addition to the fair market value of your current dwelling.) The agency will compute the maximum payment you are eligible to receive. The purchase supplement includes a price differential (the amount by which a replacement dwelling exceeds the acquisition price paid for your current home), increased mortgage interest costs (if the interest rate on your new mortgage is larger than the interest rate you currently have), and incidental expenses (such as the reasonable closing costs incurred - not including real estate taxes and property insurance).
>
> Rental Assistance: If you are an owner-occupant or tenant of 90 days or more immediately prior to the initiation of negotiations, you may be eligible for a rental assistance payment. This payment is designed to enable you to rent a comparable decent, safe and sanitary replacement dwelling for a 42 month period. The agency will determine the maximum payment you may be eligible to receive.
>
> Down Payment: If you are an owner-occupant of 90-179 days or a tenant of 90 days or more immediately prior to the initiation of negotiations, you may be eligible for a down payment and incidental expenses toward the purchase of a replacement dwelling. A relocation counselor will be able to explain how the Agency determines the maximum down payment assistance payment.

Relocation Assistance Services: Any individual displaced by a Federal or federally assisted program shall be offered relocation assistance services for the purpose of locating a suitable replacement property. Relocation services are provided by qualified individuals employed by BART/SamTrans. The relocation personnel are there specifically to help and advise you so that you understand fully all of your rights and benefits. Do not hesitate to call the project office at (415) 827-3750 if you have questions about this or anything related to the SFO Extension Project.

EXHIBIT C

RESIDENTIAL OCCUPANT RELOCATION ASSISTANCE QUESTIONNAIRE

BART and SamTrans SFO Extension Project

Date________________________

Head of Household ____
Address____
Street /Apt. No. City State Zip Code

Telephone: home ____________________ work ________________________

Present Housing: house _____ apt. _____ duplex _____

Date moved into present address____________________ Sq. Ft. __________

No. of Rooms__________ No. of Bdrms.__________ No. of Baths__________

List any special features of your current dwelling________________________

____

Type of occupancy:own __________ rent ____________

How many occupants live in the dwelling?____________________________

FAMILY MEMBER NAME (List in this order: Head, Wife, Children, Others)	RELATION TO FAMILY HEAD (Head, Wife, Son, etc.)	SEX	AGE	DISTANCE TO EMPLOYER OR SCHOOL	LOCATION OF EMPLOYMENT

Is anyone in your household physically impaired? yes ____________ no____________

If yes, whom?____

What special features does this individual need in the replacement dwelling?

____

____

What is your principal means of transportation? car_______ ride with others _______

walk_______ public transportation_______ other_________

If you were to move from the area, would you prefer to rent_________ or buy________?

To what area would you prefer to move?________________________________

Your current school district____

Is it your preference to remain in this school district? yes____ no____ no preference___

____

If you are the homeowner, please complete the following section:

Do you have a mortgage on the dwelling? yes _____ no_______

If yes, please provide the following information about your mortgage:

Mortgage holder ____

Address____

Account Number____

Year you mortgaged the property______________________________

Term of the mortgage_____________ Current interest rate__________%

Is this a variable interest rate? yes____________ no ____________

Do any of the occupants of the dwelling pay rent to you? ? yes__________ no _______

If yes, please list the occupants and the amount of rent paid._______________

____

If you are a tenant on the property, please complete the following section:

How much do you pay monthly for rent?____________________

How much (on the average)are your monthly utility payments? $________gas

$______electric $________water/sewer/trash $______other

Does your monthly rent include any utilities? yes______ no________

If yes, please list ____________________

Is your monthly payment for rent and utilities more than 30% of the total monthly gross income of the household? yes________ no__________

If yes, what is the gross monthly income of the household?__________

What is the primary source of your monthly income? employment _____

retirement pension____ unemployment _____ social security____

public assistance/welfare_____ self-employment _____

Do you rent or own the furniture in the dwelling? rent ________own __________

If renting, is the cost included in your monthly rent? yes______ no______

What major appliances are owned by you?____________________

By the landlord?____________________

Do you own any improvements on the land? yes________ no________

Description____________________

____

Do you operate a business from your dwelling? yes__________ no__________

If yes, please describe____________________

____

If you have any additional remarks or information you would like to add, please feel free to include them here.____________________

____

____

____

____

UNIVERSAL
FIELD SERVICES, INC.

EXHIBIT D

Relocation Specialist
BART/Sam Trans
SFO Extension
240 Tanforan Park
San Bruno, CA 94066
Phone: 415/827-3750
Fax: 415/873-0887

January 9, 1996

Business Owner

Dear Business Owner:

As you may be aware, the Bay Area Rapid Transit Board of Directors (BART) in conjunction with the San Mateo County Transit District Board of Directors (SamTrans) is working toward a proposed extension of BART to the San Francisco International Airport. The SFO extension project, if implemented, is expected to greatly benefit Bay Area residents in many ways, including relief from some of the current and future strain on Bay Area Highways. We are asking you to complete and return the enclosed questionnaire as part of the continuing effort to make this project a reality.

In November of 1995, the locally preferred alternative (LPA) for the proposed project was selected. As a result, it appears some businesses in your area may be affected. BART/SamTrans has selected Universal Field Services, Inc., a firm that specializes in providing relocation assistance under the Uniform Act, to complete a study to determine what the future business needs are if indeed your business is affected. Your cooperation in returning the enclosed form is critical in the preparation of the study. The information you provide is absolutely confidential and will not be shared with any other agency or individuals; the only purpose of this questionnaire is to prepare a relocation assistance plan for the benefit of you and the other business owners in the event your businesses are affected by this project.

If your business site is acquired as a result of this project, you will be entitled to certain benefits provided under the Federal Uniform Relocation Act, a federal law designed to help individuals and businesses that are displaced due to such project. Every question on the form is relevant to the study and/or will help us determine how we can best help in your business relocation. Please take the time to answer each question as accurately as possible. Feel free to ask the undersigned any questions you may have concerning the questionnaire if clarification is needed.

Thank you in advance for completing the enclosed questionnaire. If you have any further questions about the enclosed documents or the proposed project, do not hesitate to call or visit the project office located in the Tanforan Park Shopping Center (upper level, facing El Camino Real above Walgreens, next to Sears). The phone number at the project office is (415) 827-3750.

Sincerely,

C. David Hulbert, SR/WA
Project Manager, Relocation Study

BUSINESS RELOCATION SURVEY

EXHIBIT E

BUSINESS NAME: ______________________________ DATE: ___________________

BUSINESS ADDRESS: _________________________ PHONE #: ________________

BUSINESS CITY: _____________________ STATE: ____ ZIP CODE: _____________

OWNER: ___________________________ CONTACT PERSON: ____________________

1. Type of Business:

Construction: ___ Manufacturing: ___ Transportation/Public Util.: ___
Wholesale: ____ Retail Trade: ____ Finance/Insurance/Real Estate: ___
Services: __ Government/non-profit: __ Other: _________________________
Describe Operations: ____
____

2. Operational Status:

Occupancy: Owner __ Tenant __ Subtenants __
Years in Business at this Location _______________________
Lease term: _______ Lease term Remaining: _________________
Monthly Rental/lease rate: ________________________________
Annual Gross Revenues: ___________________________________
Estimated Annual Net Revenues: ___________________________
Estimated Monthly Payroll: ________________________________

3. Physical Features:

Facilities: Square Footages
Office areas ________________
Retail areas ________________
Warehouse areas ________________
Manufacturing areas ________________
Other ________________
Total Occupied Area ________________

Business Improvements installed by owner (Other than buildings):
____
____
____
____

4. Average Annual Number of Employees:

Total ______________
Managerial & Professional ______________
Sales ______________
Clerical ______________
Skilled Crafts ______________
Semi and Unskilled ______________
Other (Describe) ________________________________

5. Does your firm employ handicapped persons? _____Yes ____No

Type of handicap____
Special provisions needed__________________________________

6. Certified minority owned business: _____Yes _____No

7. Where is your current marketing area?

Describe general draw area - Where do your customers come from:
____
____
____
____

8. Relocation Preferences:

Must be in the immediate area? ______Yes ______No
Reason(s):____
____
____
____

Within the City of _________________

Other Specific Locations:______________________________
____

Would Business Owner consider:	YES	NO
Building a new building?	___	__
Relocating to an Industrial Park?	___	__
Expanding at a new location?	___	__

Other____
____

Needed Size of Building at new location?

Similar _____ Larger _______Sq. Ft. Smaller _______Sq. Ft.

Describe any special physical or locational features desired at the relocation site: _______________________________________
____
____
____
____

(Use back of this sheet or attach additional relevant facts.)

BUSSURVD

EXHIBIT F

RESIDENTIAL RELOCATION ASSISTANCE PROGRAM

OF THE

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

(BART)

AND THE

San Mateo County Transit District

(SAMTRANS)

Prepared by Universal Field Services, Inc.

January 1996

Dear Occupant:

As the San Francisco Bay Area Rapid Transit District (BART) expands its system to better serve the transportation needs of the growing Bay Area Community, it is not always possible to avoid displacement of some owners or tenants from their homes. To minimize the impact caused by such displacement, BART/SAMTRANS has established two programs designed to help you.

1. The Relocation Assistance Program, and

2. The Relocation Payments Program

This brochure broadly summarizes these programs and describes the principal provisions of relocation legislation concerning eligibility requirements and where and how to get assistance and payments. Because of their wide scope, relocation regulations are complicated and difficult to understand. Therefore, persons reading this brochure are urged not to form advance opinions as to the benefits and amounts to which they may be entitled. Strict requirements must be met before eligibility can be established and payment benefits determined. Premature action may jeopardize your eligibility for relocation payment.

We are available to answer your questions and to assist you in understanding the relocation program. Should you desire further information, please contact the Relocation Advisor whose name and telephone number are shown on the last page of this brochure. We look forward to working with you to provide an efficient and effective transit improvement program.

Manager of Real Estate

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WHAT IS RELOCATION ASSISTANCE?

Relocation Assistance is a service provided to you by BART/SAMTRANS' Relocation Staff. It is designed to help you find a replacement dwelling unit. No money payments are made under this program.

A Relocation Advisor is assigned to each displacee for this purpose. Your Relocation Advisor will assist you in finding properties being offered for sale or rent that are suitable in condition, price or rental range. Also available is information concerning the services and benefits offered by other agencies. The Relocation Advisor is your principal contact in all matters concerning BART/SAMTRANS Relocation programs and procedures.

WHAT ARE RELOCATION PAYMENTS?

Relocation payments are monies paid to an occupant for moving costs and as "Supplemental Housing Benefits". The type and amount of payment depends upon whether you are an owner or a tenant as well as many additional factors. These benefit payments are described in more detail later in this brochure.

Please do not make any assumptions as to the amount of any benefit you may be eligible for based upon this brochure. Your Relocation Advisor will meet with you and calculate your actual benefit payments after identifying all relevant factors as to your specific situation.

WHO IS ELIGIBLE FOR BENEFITS?

Every owner occupant or tenant occupant who is displaced from their dwelling unit as a result of a public project of BART/SAMTRANS is protected under either the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act) or corresponding State legislation. The law requires, in part, that "No lawful occupant shall be required to move unless he or she has received at least 90 days' advance written notice of the earliest date by which he or she may be required to move."

CAUTION

Relocation legislation establishes strict eligibility requirements for owners and tenants. To receive payment for a particular benefit as either an owner or tenant you must satisfy ALL requirements for that particular benefit payment.

WHAT ARE RELOCATION BENEFITS FOR HOME OWNERS?

Benefits available for home owners are divided into three (3) categories. Which category you are in is dependent on the amount of time you have occupied your dwelling.

A. Benefits available for home owners in occupancy for 180 days or more prior to the first written offer to purchase their home are:

1.	Relocation Assistance	Page 1
2.	Moving Cost Payments	Page 2
3.	A Purchase Differential Payment	Page 3
4.	Incidental Costs of Purchase Payment	Page 4
5.	An Interest Differential	Page 4

B. Benefits available for home owners in occupancy for 90 days or more but less than 180 days prior to the first written offer to purchase their home are:

1.	Relocation Assistance	Page 1
2.	Moving Cost Payments	Page 2
3.	A Down Payment Benefit (includes incidental costs of purchase)	Page 9
	OR	
4.	A rental supplement payment	Page 8

C Benefits available for homeowners in occupancy for less than 90 days prior to the first written offer to purchase their home are:

1.	Relocation Assistance	Page 1
2.	Moving Cost Payments	Page 2

NOTE: Benefit payments as stated in "B" may be available to owners in this category under provisions of "Last Resort Housing". Your Relocation Advisor will assist you in determining your eligibility, if any, under "Last Resort Housing" procedures.

MOVING COST PAYMENTS

Moving payments are designed to help pay the expenses encountered when you move personal property from your home. In general, moving expenses include all the regular and normal costs of the following services:

- Disconnecting and reconnecting household appliances
- Packing, unpacking personal property
- Temporary storage of personal property, if required
- Insurance while property is in storage or transit
- Transfer of telephone service and other similar utility connections
- Other expenses considered eligible by BART/SAMTRANS

Moving expenses do not include any additions, improvements, alteration or other structural changes in connection with moving personal property, except where required by law.

Because a claim must be filed before any moving payment can be made, be certain that the move will be proper and eligible for payment by contacting your Relocation Advisor BEFORE any action is taken.

An occupant or a dwelling unit may claim moving expenses by either of the following methods:

1. A fixed payment based on a room count of the acquired dwelling you moved from, or

2. Actual reasonable cost of moving by a qualified commercial moving company.

Your Relocation Advisor will be glad to help you select the method most advantageous to you.

LIMITATIONS

Moving payments are limited to a distance of 50 miles. Charges for additional mileage are the responsibility of the person(s) being moved.

FIXED PAYMENT

In this method, payment is based on the number of rooms in the dwelling moved from, exclusive of bathrooms. Eligible rooms are those normally used by the occupant(s) for the accommodation of personal property and generally limited to the living room, dining room, kitchen, family room and bedroom(s).

The following is the fixed payment schedule for residential occupants who own their furniture:

1 room	$450.00	5 rooms	$1,050.00	Each additional room - $150.00
2 rooms	$600.00	6 rooms	$1,250.00	
3 rooms	$750.00	7 rooms	$1,450.00	
4 rooms	$850.00	8 rooms	$1,600.00	

This benefit has nothing to do with actual costs of moving and requires no proof of expenses. It is particularly suitable for occupants who wish to move themselves.

MOBILE HOMES

The fixed payment option is available to mobile home occupants who move only their personal belongings. It is not available for the move of the mobile home itself.

ACTUAL MOVING COST METHOD USING A COMMERCIAL MOVER

This option provides for payment of actual reasonable expenses of moving up to a distance of 50 miles. It assumes the use of a qualified commercial mover who may be paid either directly by BART/SAMTRANS or the displacee. The mover to used is selected by a bid process accomplished by BART/SAMTRANS. Please NOTE, you do not have to use the low bidder selected by BART/SAMTRANS; however, payment to reimburse you or directly to any other mover you select will be limited to the amount of the low bid obtained by BART/SAMTRANS.

Moving expenses in this option may also include reimbursement to the displacee for reasonable reconnection of items such as appliances, telephones and cable television. Please consult with your Relocation Advisor about eligible costs.

Before any moving payments can be made or authorized, the relocatee must have filed the proper claim with BART/SAMTRANS. Therefore, you should contact your Relocation Advisor three to four weeks in advance of your moving date. Payment takes about three weeks to process after the claim is filed and cannot be made until after the move has been completed. If this procedure should create a hardship for you, please explain the situation to your Relocation Advisor to see if a special payment can be arranged.

MOBILE HOMES

The actual cost moving procedure discussed above is used for the move of a mobile home and its contents and may be used for a move of its contents only. A mobile home move also includes the move of any attached appurtenances, such as porches, decks, awnings not acquired. It may also include a park entrance fee.

PURCHASE DIFFERENTIAL PAYMENT

An eligible owner-occupant of a dwelling who meets all requirements is entitled to receive a payment representing the difference, if any, between the price BART/SAMTRANS paid for their home and the price required to purchase a comparable decent, safe and sanitary dwelling. This is not extra compensation for the improvement acquired by BART/SAMTRANS, but a housing supplement to assist in purchasing an available, comparable replacement home.

A decent, safe and sanitary dwelling is one which meets local building, housing and occupancy codes, and meets minimal State and Federal requirements. BART/SAMTRANS will arrange for the home you are considering purchasing to be inspected for conformance to these standards. REMEMBER, your replacement home must be inspected for and comply with decent, safe and sanitary standards before relocation payments can be applied toward its purchase.

A study will be made to find the market selling price of a decent, safe and sanitary dwelling which is functionally comparable to the one being purchased by BART/SAMTRANS. If the price BART/SAMTRANS pays you for your home is lower than the price found by the study, the difference will be the maximum housing supplement available to you. The final amount of the supplement will be computed based on the amount you actually pay for the replacement home, but no more than the maximum determined by the BART/SAMTRANS study.

INCIDENTAL COSTS OF PURCHASE PAYMENT

An owner-occupant of a dwelling who meets all requirements is entitled to payment of their non-recurring closing costs incurred in the purchase of a decent, safe and sanitary replacement dwelling. These costs include such items as title insurance, points, recording fees, escrow fees and notary fees. These costs are further defined as one-time charges and DO NOT include property taxes, dwelling insurance, interest charges and other similar costs.

INTEREST DIFFERENTIAL PAYMENT

An owner-occupant of a dwelling who meets all requirements is entitled to payment of the "additional interest costs" incurred in the purchase of a decent, safe and sanitary replacement dwelling. The amount of this benefit is derived by means of a mathematical formula. The intent of this benefit is to relieve you of the burden of a higher interest rate. Essentially, it is that amount of money necessary to reduce your new loan to a point where the monthly payment you have to make (principal and interest) is the same as that which you were paying on the loan on the property acquired by BART/SAMTRANS.

Calculation of this benefit is very complicated; consult your Relocation Advisor if you believe you are eligible.

NOTE: The aggregate cost of the purchase differential, incidental costs and interest differential payments MAY NOT EXCEED $22,500.

MOBILE HOMES

Purchase differential, incidental costs and interest differential benefits are available to owners of mobile homes. Because of the nature of typical mobile home ownership, the benefit calculations become extremely complicated. Your Relocation Advisor will need as much time as possible and your full cooperation to ensure timely payment.

WHAT ARE THE REQUIREMENTS TO OBTAIN HOME OWNER BENEFITS?

Following are listed the major requirements for each benefit, but they are not all inclusive. Please consult your Relocation Advisor about additional requirements, if any, to ensure compliance before you vacate.

BENEFIT		REQUIREMENT
RELOCATION ASSISTANCE	1.	Occupy a dwelling unit acquired by BART/SAMTRANS for a public purpose.
MOVING COSTS	1.	Occupy a dwelling unit acquired by BART/SAMTRANS for a public purpose prior to and at the date of possession of the dwelling unit by BART/SAMTRANS.
	2.	Vacate the BART/SAMTRANS acquired dwelling unit.
	3.	File a claim with 18 months of your move date.

BENEFIT		REQUIREMENTS
PURCHASE DIFFERENTIAL PAYMENT	1.	Own and occupy a dwelling unit for 180 days or more **prior to** BART/SAMTRANS' first written offer to purchase your home.
	2.	Vacate the BART/SAMTRANS acquired dwelling unit.
	3.	BART/SAMTRANS has obtained legal possession of your property or escrow has closed on the purchase of your property.
	4.	Purchase a decent, safe and sanitary replacement dwelling within one year of vacating.
	5.	File a claim.
INCIDENTAL COST PAYMENT	1.	Own and occupy a dwelling unit for 180 days or more **prior to** the first written offer to purchase your home.
	2.	Vacate the BART/SAMTRANS acquired dwelling unit.
	3.	BART/SAMTRANS has legal possession of the property.
	4.	Purchase a decent, safe and sanitary replacement dwelling within one year of vacating. Benefit limited to nonrecurring closing costs as defined by law.
	5.	File a claim.
INTEREST DIFFERENTIAL PAYMENT	1.	Own and occupy a dwelling unit for 180 days or more **prior to** BART/SAMTRANS' first written offer to purchase your home.
	2.	Vacate the acquired dwelling unit.
	3.	BART/SAMTRANS has legal possession of your property.
	4.	Have an outstanding loan balance on your dwelling when acquired by BART/SAMTRANS.
	5.	Purchase a decent, safe and sanitary replacement dwelling within one year of vacating.
	6.	Have a loan balance on your replacement dwelling carrying a higher interest rate than the loan on your home acquired by BART/SAMTRANS.
	7.	File a claim.

NOTE: This benefit is limited to a formula computation as established by law.

WHAT ARE THE RELOCATION BENEFITS FOR TENANTS?

Benefits for tenant occupants of a dwelling unit are divided into two (2) categories. Which category you are in depends upon a time requirement.

A. Benefits available for tenants in occupancy for 90 days or more prior to the first written offer to purchase the property are:

1.	Relocation Assistance	Page 1
2.	Moving Cost Payments	Page 2
	AND	
3.	A Rental Supplement Payment	Page 8
	OR	
4.	A Down Payment Benefit Payment	Page 9

B. Benefits available for tenants in occupancy for less than 90 days prior to the first written offer to purchase the property are:

1.	Relocation Assistance	Page 1
2.	Moving Cost Payments	Page 2

NOTE: Benefit payments as stated in "A" may be available to tenants in this category under the provisions of "Last Resort Housing". Your Relocation Assistance Advisor will assist you in determining your eligibility, if any, under the "Last Resort Housing" procedures.

MOVING COST PAYMENTS

Moving payments are designed to help pay the expenses encountered when you move personal property from your home.

In general, moving expenses include all the regular and normal costs of the following:

- Disconnecting and reconnecting household appliances
- Packing, unpacking personal property
- Temporary storage of personal property, if required
- Insurance while property is in storage or transit
- Transfer of telephone service and other similar utility connections
- Other expenses considered eligible by BART/SAMTRANS

Moving expenses do not include any addition, improvements, alterations or other structural changes in connection with moving your personal property except as required by law.

Because a claim must be filed before any moving payment can be made, be certain the move will be proper and eligible for payment by contacting your Relocation Advisor BEFORE any action is taken.

An occupant of a dwelling unit may claim moving expenses by any of the following methods:

1. A fixed payment amount based on a room count of the BART/SAMTRANS acquired dwelling from which you moved.

2. Actual cost of moving by a qualified moving company.

Your Relocation Advisor will be glad to help you select the method most advantageous to you.

LIMITATION

Moving payments for transportation charges are limited to a distance of 50 miles. Charges for additional mileage are the responsibility of the person(s) being moved.

FIXED PAYMENT

In this method, payment is based on the number of rooms in the dwelling you moved from, exclusive of bathrooms. Eligible rooms are those used by an occupant for the accommodation of their personal property and are generally limited to the living room, dining room, kitchen, family room and bedrooms. A schedule of payments under this method is included in this brochure on page 3.

This benefit has nothing to do with the actual costs of moving and requires no proof of expenses. It is particularly suitable for occupants who wish to move themselves.

ACTUAL MOVING COST METHOD USING A COMMERCIAL MOVER

This option provides for a payment of actual reasonable expenses of moving up to a distance of 50 miles. It assumes the use of a qualified commercial mover who may be paid either directly by BART/SAMTRANS or the displacee. The mover to be used is selected by a bid process accomplished by BART/SAMTRANS. Please NOTE, you do not have to use the low bidder selected by BART/SAMTRANS; however, payment to reimburse you or directly to any other mover you select will be limited to the amount of the low bid obtained by BART/SAMTRANS.

Moving expenses in this option may also include reimbursement to you for reasonable reconnection of items such as appliances, telephones and cable television. Please consult with your Relocation Advisor about these eligible costs.

Before any moving payments can be made or authorized, the relocatee must have filed the proper claim with BART/SAMTRANS. Therefore, you should contact your Relocation Advisor three to four weeks in advance of your moving date. Payment takes about three weeks to process after the claim is filed and cannot be made until after the move has been completed. If this procedure should create a hardship for you, please explain the situation to your Relocation Advisor to see if a special payment can be arranged

MOBILE HOMES

Where the displaced person is the tenant-occupant of a mobile home who moves their personal property, payment is based on any of the methods described previously.

RENTAL SUPPLEMENT PAYMENT

A rent supplement payment is the amount, if any, determined by BART/SAMTRANS which equals 42 times the difference between:

1. The monthly amount necessary to rent a decent, safe and sanitary replacement dwelling which is comparable to your BART/SAMTRANS acquired dwelling; AND

2. A. The monthly rent and utility costs of your BART/SAMTRANS acquired dwelling unit at the time it was purchased by BART/SAMTRANS, OR

B. When the actual rental and utility costs exceed 30% of your gross monthly income, 30% of your certified gross monthly income.

The rent supplement, when added to the amount of your present rent, will enable you to rent decent, safe and sanitary housing for 42 months. Your Relocation Advisor will inform you in writing of the amount of payment you are entitled to receive.

You are not required to rent accommodations comparable to your former dwelling to qualify for this supplement. Comparability is simply a standard used to determine the maximum amount you may be entitled to claim. However, your replacement accommodations must pass the decent, safe and sanitary test. BART/SAMTRANS will arrange for an inspection of any dwelling you may wish to rent to determine whether it meets applicable decent, safe and sanitary standards in order for you to be eligible for rental supplement payments.

You may file a claim far a rental supplement payment any time after you have rented a decent, safe and sanitary dwelling unit. However, you must file your claim no later than 18 months after the date on which you moved from your BART/SAMTRANS acquired home. THIS PAYMENT MAY NOT EXCEED $5,250.00.

A "Decent, Safe and Sanitary" dwelling is one which meets local building, housing and occupancy codes, and meets minimal State and Federal requirements. BART/SAMTRANS will arrange for the dwelling you are considering purchasing or renting to be inspected for decent, safe and sanitary standards before any relocation payments can be applied toward its purchase or rental.

DOWN PAYMENT BENEFIT

This payment is designed to help you make a down payment on the purchase of a replacement dwelling. The amount of payment is determined by BART/SAMTRANS and is limited by law. There are two (2) groups of people who are eligible for this payment:

1. Renters who have lived in a residence for a least 90 consecutive days immediately preceding the date the first written to purchase was made by BART/SAMTRANS to the owner;

OR

2. Owners who have lived in the BART/SAMTRANS acquired dwelling for at least 90 consecutive days immediately preceding the first written offer.

Tenants who choose to purchase a decent, safe and sanitary replacement home may apply the amount of their rent supplement toward the down payment on the home, or $5,250.00 - whichever is greater. Owners who choose to purchase a decent, safe and sanitary replacement home pursuant to this provision are limited to the amount they would have otherwise received as a **Purchase Differential** (See page 3 in this brochure).

Payments made pursuant to this provision are first applied toward non-recurring (escrow & closing) costs; such as, escrow fees, title insurance, recording fees, etc. Any remaining balance available must be applied toward reducing the amount of any loan necessary to purchase the replacement home.

Payment cannot be made toward such costs as fire insurance, property taxes and other expenses determined to be recurring. Your Relocation Assistance Advisor can provide you with further details. The down payment process normally takes about six (6) weeks. Therefore, be sure to contact your Relocation Advisor as soon as you have made a decision to purchase your replacement home. THIS PAYMENT MAY NOT EXCEED $5,250.00.

MOBILE HOMES

The rent supplement payment and/or the down payment benefit option is available to tenants in mobile homes. Because of the nature of mobile home tenancy, the benefit calculations can become extremely complicated. Your Relocation Advisor will need as much time as possible and your full cooperation to ensure timely payment processing.

WHAT ARE THE REQUIREMENTS TO OBTAIN TENANT BENEFITS?

The following are the major requirements for each benefit, but they are not all inclusive. Please consult with your Relocation Advisor about additional requirements, if any, to ensure compliance before you vacate.

BENEFIT	REQUIREMENT
RELOCATION ASSISTANCE	1. Occupy a dwelling unit acquired by BART/SAMTRANS for a public purpose.
MOVING COSTS	1. Occupy a dwelling unit acquired by BART/SAMTRANS prior to and at the date of possession of the dwelling unit by BART/SAMTRANS.
	2. Vacate the dwelling.
	3. File a claim within 18 months of the date you moved.
RENTAL SUPPLEMENT	1. Occupy a dwelling for 90 days or more prior to and at BART/SAMTRANS' date of first written offer to purchase the property.
	2. Vacate the dwelling.
	3. BART/SAMTRANS owns or has legal possession of the property.
	4. Rent a decent, safe and sanitary replacement dwelling within one (1) year of vacating the acquired dwelling and pay rent, including utilities, more than the average rent you were paying for the three (3) month period prior to vacating and/or 30% of your gross monthly certified income.
DOWN PAYMENT BENEFIT	1. Occupy a dwelling for 90 days or more **prior to** and at BART/SAMTRANS' date of first written offer to purchase the property.
	2. Vacate the dwelling.
	3. BART/SAMTRANS owns or has legal possession of the property.
	4. Purchase a decent, safe and sanitary replacement dwelling within one (1) year of vacating the BART/SAMTRANS acquired property.

5. File a claim within 18 months of the date you move from the BART/SAMTRANS acquired dwelling.

LAST RESORT HOUSING

Last Resort Housing is a procedure wherein BART/SAMTRANS may, based upon rigorous additional documentation, exceed the $5,250.00 and $22,500.00 monetary benefit limits stated previously in order to provide comparable replacement housing. This procedure also provides other replacement options such as direct purchase, rehabilitation or construction of replacement housing. All displaced persons whose calculated replacement housing benefits exceed the statutory limits are entitled to last resort housing benefits. Your Relocation Advisor will inform you if you might fall within the last resort housing procedures and will provide you with any special requirements you must meet.

APPEALS

If you have been denied a payment which you feel you should have received, or if you believe the amount of the benefit was not correctly computed, or feel replacement housing provided you was not adequate to meet your needs, you should contact your Relocation Advisor. You will then be provided with the necessary information so you may file a proper relocation assistance appeal.

Your appeal is an administrative process established by BART/SAMTRANS to ensure all persons displaced as a result of a BART/SAMTRANS project are treated equitably and fairly. The appeal is heard at an informal hearing of the BART/SAMTRANS Relocation Appeal Board. You have the right to be represented by legal counsel.

You and/or your legal counsel may present your case before the Appeals Board, but BART/SAMTRANS does not reimburse you for the costs of your attorney, if any. If dissatisfied with the written Appeals Board decision, you have the right to a judicial review of this administrative appeal.

If you are a tenant, appeals must be filed no later than 6 months after the date you have vacated the BART/SAMTRANS acquired dwelling unit. If you are a dwelling owner, an appeal must be filed within 6 months of the later of:

A. The date on which BART/SAMTRANS has made its final payment of all costs for the acquired property, or, in the case of condemnation, the date the required amount is deposited into court; or

B. The date you vacated the acquired property.

You may accept the BART/SAMTRANS authorized amount of your claim without affecting your right to appeal for an additional amount.

Your necessary and reasonable expenses will be paid if you must travel over 25 miles to an appeal hearing.

IMPORTANT NOTICE

By law, relocation payments are not considered as income for the purpose of personal income tax laws. Furthermore. these payments are not considered income or resources to persons who receive welfare or public assistance payments. Relocation benefit payments are also generally not subject to attachment for payment of debt or liens. If any problem arises regarding this, please notify your Relocation Advisor immediately who will assist you in determining your liability.

DS&S INSPECTION

The decent, safe and sanitary inspection of the replacement dwelling will be conducted by BART/SAMTRANS personnel or their consultant for the sole purpose of determining your eligibility for a replacement housing payment. You must not interpret BART/SAMTRANS' approval of a dwelling as providing any guarantee there are not deficiencies in the dwelling or in its fixtures and equipment which may be discovered at a later date.

It is your responsibility to protect your best interest and investment in the purchase or rental of your replacement dwelling. You must clearly understand BART/SAMTRANS assumes no responsibility or liability for structural, mechanical, legal or other unforeseen problems which may be discovered after the inspection has been conducted.

ADDITIONAL INFORMATION

No person eligible for relocation payments and who lawfully occupies real property required for a project will be asked to move without first being given at least a 90 day advance written notice. No occupant(s) of any type of dwelling who is eligible for relocation payments will be required to move unless appropriate decent, safe and sanitary replacement housing - which is open to all persons regardless of race, color, religion, sex or national origin - has been made available to them by BART/SAMTRANS or they have secured such housing for themselves. Notwithstanding the above, if you elect to remain in your home as a tenant of BART/SAMTRANS subsequent to BART/SAMTRANS' purchase you may be evicted for the following reasons WITHOUT a 90 day advance written notice:

1. Failure to pay rent, except for just cause.
2. Performance of a dangerous or illegal act in the unit.
3. Material breach of the rental agreement and failure to correct same within 30 days of written notice.
4. Maintenance of a nuisance and failure to abate within a reasonable time following written notice.
5. The eviction is required by State law, County ordinance or City code, and cannot be prevented by reasonable efforts on the part of BART/SAMTRANS.

Eviction for any of the above reasons in no way affects the eligibility of displaced persons who are otherwise eligible for relocation assistance benefits. Additional information regarding the Relocation Assistance Program can be obtained from your Relocation Advisor.

CAUTION

This brochure gives a general description of the Relocation Assistance Program and is not intended to be a complete statement of all of the Federal and State laws and regulations which must be followed to ensure you receive the proper amount of relocation assistance benefits you are entitled otherwise to receive. Loss of eligibility to all or a portion of your benefits may occur if you sell or move from your property or home without first contacting your Relocation Advisor.

YOUR RELOCATION ADVISOR IS: ______________________

PHONE (____)__________________

EXHIBIT G

BUSINESS RELOCATION ASSISTANCE PROGRAM

OF THE

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

(BART)

AND THE

SAN MATEO COUNTY TRANSIT DISTRICT

(SAMTRANS)

Prepared by

Universal Field Services, Inc.

January 1996

Dear Business Owner:

As the San Francisco Bay Area Rapid Transit District (BART) expands its system to better serve the transportation needs of the growing Bay Area community, it is not always possible to avoid displacing some businesses, farms or non-profit organizations from their property. To minimize the impact caused by such displacement, BART/SAMTRANS has established two programs designed to help you. These are the **Relocation Advisory Assistance Program and the Relocation Assistance Payment Program**. With these programs and your cooperation, the relocation from your current place of business to your new location should go as smoothly as possible.

This brochure is intended to broadly summarize the provisions of these programs. It highlights the major provisions of the relocation law. It also provides you with the eligibility requirements and general procedures for applying for each of the payments you may be entitled to receive. Unfortunately, the Relocation Assistance Act is fairly complex and the administrative regulations are detailed. Therefore, I urge you to work closely with your assigned Relocation Assistance Advisor to ensure you receive all of the benefits you are entitled to receive. Merely reading this brochure will not guarantee your receiving all of your benefits - please don't form opinions as to what you may or may not be entitled to receive until you have fully discussed the details and facts with your Relocation Assistance Advisor.

We are available to answer your questions and to assist you in understanding the relocation program. Please ask your Relocation Assistance Advisor, whose name and telephone number are shown on the last page of this brochure, concerning any questions you may have. We look forward to working with you to ensure you receive all of the relocation benefits you are entitled to receive.

Manager of Real Estate, BART

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WHO IS ELIGIBLE FOR BENEFITS?

Any business, farm or nonprofit organization, as hereafter defined, in lawful occupancy of a property at the time of the first written offer and who is displaced from that property as a result of a BART/SAMTRANS project is eligible to receive benefits under the Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act) or corresponding State Legislation or both.

BUSINESS

With the exception of a farm operation, a business is defined as any lawful activity conducted primarily for the purchase, sale, lease, and rental of personal or real property; or for the manufacture, processing, and/or marketing of products, commodities, or any other personal property; or for the sale of services to the public; or, solely for the purpose of this Act, an outdoor advertising display or displays, when the display(s) must be moved as a result of the project. A **"small business"** is defined as a business having at least one but not more than 500 employees working at the site being acquired or who will be displaced by a program or project.

FARM

A farm is defined as any activity conducted solely or primarily for the production of one or more agricultural products or commodities - including timber - for sale and home use, and customarily producing such products or commodities in sufficient quantity to be capable of contributing materially to the operator's support.

NONPROFIT ORGANIZATION

A public or private entity that has established its nonprofit status under applicable Federal or State law.

WHAT RELOCATION BENEFITS ARE AVAILABLE?

For a Business, Farm or Non-Profit Organization:

1. Relocation Assistance
2. Moving Cost Payments
3. Search Cost Payments

4. An "In Lieu" Payment

The law requires in part that "No lawful occupant shall be required to move unless he or she has received at least 90 days advance written notice of the earliest date by which he or she may be required to move."

WHAT IS THE RELOCATION ASSISTANCE PROGRAM?

The following checklist provided a summary of the relocation assistance you may reasonably expect to receive if you are displaced by a BART/SAMTRANS project. In addition to the services listed, BART/SAMTRANS is required to coordinate it relocation activities with other public agencies which may have displacements in the project area to ensure that all persons displaced receive fair and consistent relocation benefits.

BART/SAMTRANS' Relocation Assistance Advisor must personally interview displaced persons to:

- Determine their needs and preferences.
- Explain relocation benefits
- Offer assistance
- Offer transportation if necessary
- Provide current listing of properties for sale or lease which are suitable for the business or farm being displaced.
- Supply information on other Federal and State Programs which may be offered to assistant the displaced business or farm owner.
- Provide necessary counseling to minimize hardships.

WHAT ARE THE REQUIREMENTS TO OBTAIN BENEFITS?

Following are listed the major requirements for each benefit, but they are not all inclusive. Please consult your Relocation Advisor about additional requirements, if any, to ensure that you have complied before you vacate.

BENEFIT	**REQUIREMENT**
Relocation Assistance	Occupy a business property acquired by BART/SAMTRANS.

BENEFIT	**REQUIREMENT**
Moving Costs	1. Occupy a business property acquired by BART/SAMTRANS prior to and at the date of possession of the property by BART/SAMTRANS.
	2. Prepare a certified inventory of the items to be moved.
	3. Assist BART/SAMTRANS in obtaining at least two bids.
	4. a. Accept a move by the low bidder, OR b. Negotiate a self-move based on the lowest bid.
	5. Give BART/SAMTRANS reasonable notice of your move date.
	6. Vacate the premises acquired by BART/SAMTRANS.
	7. File a claim.
Search Cost Payment	1. Occupy a business property acquired by BART/SAMTRANS prior to and at the date of possession of the property by BART/SAMTRANS.
	2. Keep accurate records of time, dates, expenses, locations, individuals contacted and other details involved in the search for a replacement site.
	3. Vacate the premises acquired by BART/SAMTRANS.
	4. File a claim.

BENEFIT	**REQUIREMENT**
Business Reestablishment Payment	1. Must be a "small business".
	2. Occupy a business property acquired by BART/SAMTRANS prior to and at the date of possession of the property by BART/SAMTRANS.
	3. Keep accurate records of costs, expenses, fees, etc. incurred in reestablishing your business at the replacement location.
	4. Vacate the premises acquired by BART/SAMTRANS.
	5. File a claim.
In Lieu Payment	1. Occupy a business property acquired by BART/SAMTRANS prior to and at the date of possession of the property by BART/SAMTRANS.
	2. Request an In Lieu Payment determination.
	3. Provide BART/SAMTRANS with certified income tax returns for the two (2) appropriate years prior to the year of displacement.
	4. Vacate the premises acquired by BART/SAMTRANS.
	5. File a claim.

WHAT ARE MY MOVING OPTIONS?

For payment of moving expenses, the business, farm or nonprofit organization may claim payment under the following options:

- Option 1 - ACTUAL COSTS AS PERFORMED BY A COMMERCIAL MOVER

  The business operator may elect to have the moving job done entirely by a qualified mover. In this event, BART/SAMTRANS will work with you in obtaining moving bids and arranging the move. BART/SAMTRANS can arrange to pay the mover directly.

- Option 2 - SELF-MOVE BASED ON BIDS

  Instead of using a commercial mover, the business operator may wish to do the moving. In this event, BART/SAMTRANS will negotiate with the business operator on a moving payment not to exceed the lower of at least two moving bids. No further documentation is required except to notify BART/SAMTRANS of the date of the move. No additional costs can be added to the self-move payment to cover the operator's time, downtime to the business or overtime costs.

When personal property is abandoned with no effort being made by the owner to dispose of such property, the owner will not be entitled to claim moving expenses or losses for the items involved.

WHAT IS THE PAYMENT FOR SEARCH COSTS?

A business may claim actual reasonable expenses in looking for a replacement business site. Payment for searching expenses may not exceed $1,000.00.

Search expenses may include transportation expense, meals, lodging away from home, fees paid to a real estate agent or broker to locate a property and the reasonable value of time actually spent in searching.

All expenses claimed must be supported by receipts or other applicable documentation. Payment for time shall be based on the average hourly wage rate for the person(s) conducting the search.

WHAT ARE REESTABLISHMENT EXPENSES?

A small business, farm or non-profit organization may be eligible for a payment, not to exceed a total of $10,000, for expenses incurred in relocating and reestablishing such the enterprise at a replacement site. To qualify, the business, farm or non-profit organization must have at lest one but not more than 500 employees working at the site being affected who will be displaced by a BART/SAMTRANS project.

Reestablishment expenses may include, but are not limited to, the following:

- Repairs or improvements to the replacement property required by Federal, State or local laws, codes or ordinances.

- Modifications to the replacement real property to make the structure(s) suitable for the business operation.

- Installation of exterior sign advertising signs.

- The cost of installing utilities from the right-of-way line to the structure(s) or improvements on the replacement site. improvements.

- Redecoration or replacement such as painting, wallpapering, paneling and carpeting when required by the condition of the replacement site.

- The cost of license fees and permits when not covered as a moving expenses.

- Marketing studies, feasibility surveys and soil testing.

- Advertisement of the new business location.

- Professional real estate services needed for the purchase or lease of a replacement site.

- The estimated increased costs of operation at the replacement site during the first two years for items such as:
  - Lease or rental charges,
  - Personal or real property taxes,
  - Insurance premiums and
  - Utility charges (Excluding impact fees).
- One time assessments or impact fees for anticipated heavy utility usage.
- Other items that BART/SAMTRANS considers essential for the reestablishment of the business or farm.

WHAT IS THE IN LIEU PAYMENT?

Instead of actual moving expense payments described above, a business may claim an amount equal to **the average annual net earnings** of the business, except that such payment shall not be less than $1,000 nor more than $20,000.

For a business to be eligible for this payment, BART/SAMTRANS must determine that:

1. The business cannot be relocated without a substantial loss of existing patronage (clientele or net earnings); and,
2. The business is not part of a commercial enterprise having more than three (3) other establishments which are not being acquired, are under the same ownership and which are engaged in the same or similar business; and,
3. The business is not operated solely for the purpose of renting the site or dwelling(s) to others.
4. The business contributes materially to the income of the displaced owner in the following manner:
   a. Had average annual gross receipts of at least $5,000; or

b. Had **average annual net earnings** of at least $1,000; or

c. Contributed at least 33 1/3% of the owner(s) or operator's average annual gross income from all sources.

Average annual net earnings are those earnings before federal, state or local income taxes, generally during the two taxable years immediately preceding the taxable year in which the business is displaced. Certified copies of federal or state income tax returns are used to establish these earnings.

Any business operation that is engaged solely in the rental of space to others is not eligible for a fixed payment. This includes the rental of space for residential or business purposes.

Eligibility requirements for farms and nonprofit organizations are slightly different from business requirements. If you are interested in a fixed payment, please consult your relocation counselor for additional information if you are being displaced from a farm or you represent a nonprofit organization.

Any amount the business receives as a goodwill payment must be deducted from any In Lieu payment to be received or vice-versa.

WHAT MOVING AND RELATED COSTS ARE INELIGIBLE FOR PAYMENT?

The following moving and related cost items are specifically excepted from payment under Federal and State Relocation laws:

- The move of any structure or other real property in which you have reserved ownership.
- Interest on a loan to cover your moving and related expenses.
- Loss of goodwill.
- Loss of profits.
- Loss of trained employees.
- Additional operating costs except as otherwise provided.
- Personal injury.

- Any legal fee or cost incurred for preparing a relocation claim or for representing you before BART/SAMTRANS.
- Physical changes to real property at the replacement location, except as otherwise provided.
- Costs for storage of personal property on real property already owned or leased by you.

WHAT IS BART/SAMTRANS'S APPEALS PROCESS?

If you have been denied a payment which you think you should receive, or if you believe the amount was not correctly computed, you should contact your Relocation Advisor. Your Relocation Advisor will provide you with the necessary appeal forms and information regarding the filing of the appeal.

Your appeal is an administrative process. It will be heard by BART/SAMTRANS' Relocation Appeals Board.

You and/or your legal counsel may present your case at this level of appeal. You also have the right to judicial review if you are still dissatisfied with the Relocation Appeals Board decision.

If you are a tenant, appeals must be filed no later than 6 months after you vacate the premises acquired by BART/SAMTRANS. If you are an owner, an appeal must be filed within 6 months of the later of:

1. The date on which BART/SAMTRANS has made its final payment of all costs for the acquired property, or in the case of condemnation, the date the required amount is deposited in court; or,

2. The date you vacate the acquired property.

You may accept the amount of your claim BART/SAMTRANS agrees to pay with no effect on your right to appeal for any additional amount. In addition, except for attorney costs, you will be reimbursed for your necessary and reasonable expenses if you must travel over 25 miles to attend an appeal hearing.

IMPORTANT NOTICE

By law, relocation payments are not considered as income for the purpose of personal income tax laws. Furthermore, these payments are not considered income or resources to persons who receive welfare or public assistance payments.

Relocation benefit payments are also generally not subject to attachment for payment of debt or liens. If any problem arises regarding this, please notify your Relocation Advisor who will assist you in determining your liability.

ADDITIONAL INFORMATION

No person eligible for relocation payments and who is LAWFULLY occupying real property required for a project will be asked to move without first being given at least 90 days advance notice in writing.

Additional information regarding the Relocation Assistance Program can be obtained from your Relocation Advisor.

This brochure is a general description of the relocation assistance program and is not intended as a complete statement of all the State and Federal laws and regulations which, if not complied with, could cause loss of or reduction in the amount of relocation benefits a person might otherwise receive. Loss of eligibility may occur if you sell or move from your property without first contacting your Relocation Advisor.

Your Relocation Advisor is ______________________

and can be reached at ______________________.

U.S. Department of Interior – Section 4(f) Findings

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

MAY 29 1996

Mr. Stewart F. Taylor
Regional Administrator
Federal Transit Administration, Region IX
Suite 2210
San Francisco, California 94105-1800

Dear Mr. Taylor:

This responds to the request for the Department of the Interior's comments on the Final Section 4(f) Documentation for the **Bay Area Rapid Transit (BART) San Francisco Airport Extension**, San Francisco, San Mateo County, California.

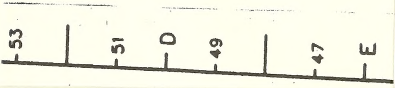
We concur that there is no prudent and feasible alternative to the proposed transit system, if project objectives are to be met. We also concur with the proposed measures to minimize harm to Section 4(f) resources.

The Department of the Interior has no objection to Section 4(f) approval of this project.

Sincerely,

Willie R. Taylor

Willie R. Taylor
Director, Office of Environmental
Policy and Compliance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